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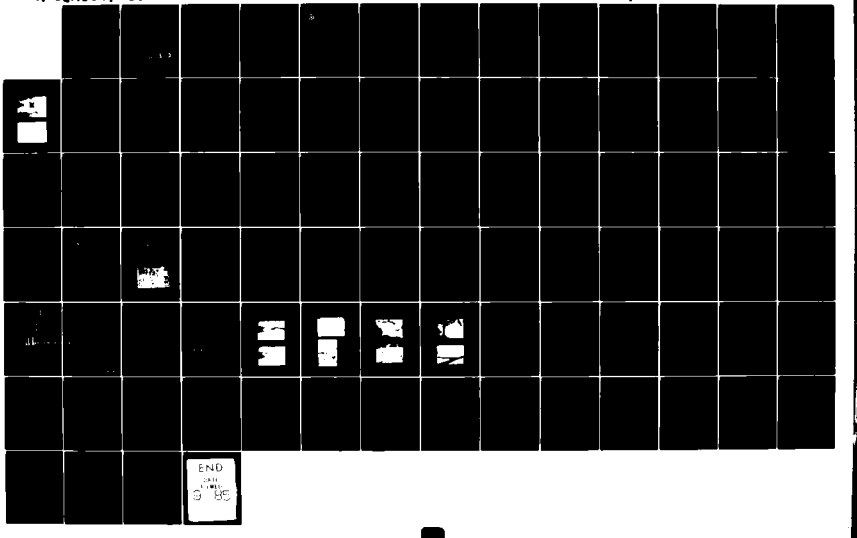

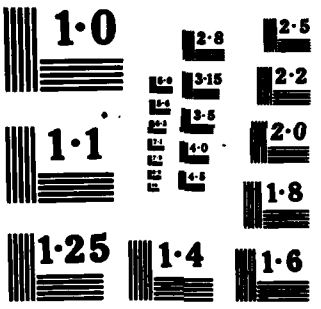
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PROVIDENCE RIVER BASIN
LINCOLN, RHODE ISLAND

OLNEY POND DAM

RI 01702

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

OCTOBER, 1979

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Providence RIver Basin
Lincoln, RHode Island
Threadmill Brook

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The dam is an earthfill dam with a masonry core wall, abbut 220 ft. long, with a maximum height of about 29.5 ft. The dam is intermediate in size with a high hazard potential. The test flood for the dam is the full PMF. THe dam was judged to be in generally fair condition. However, the spillway is not adequate to pass the routed test flood outflow. There are various operating and maintenance measures which should be undertaken by the owner.

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REPLY TO
ATTENTION OF
NEDED

JAN 17 1980

Honorable J. Joseph Garrahy
Governor of the State of Rhode Island
and Providence Plantations
State House
Providence, Rhode Island 02903

Dear Governor Garrahy:

Inclosed is a copy of the Olney Pond Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Management, the cooperating agency for the State of Rhode Island.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Management for your cooperation in carrying out this program.

Sincerely,

MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

OLNEY POND

RI 01702

THREADMILL BROOK
LINCOLN, RHODE ISLAND

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

Identification No.:	RI 01702
Name of Dam:	Olney Pond Dam
Town:	Lincoln
County and State:	Providence County, Rhode Island
Stream:	Threadmill Brook
Date of Inspection:	22 and 23 August 1979

BRIEF ASSESSMENT

Olney Pond Dam is an earthfill dam with a masonry core wall, about 220 ft. long, with a maximum height of about 29.5 ft. The dam is abutted by a rock outcrop on the left, through which a tunnel serving as the spillway for the dam has been constructed. The embankment is supported on the downstream side by a 220 ft. long masonry wall which is reinforced by a massive stepped masonry buttress. At the mid-point of the dam is a gate house which houses a 24 in. dia. sliding gate controlling inflows to a 24 in. dia. conduit which serves as the low level outlet for Olney Pond.

Olney Pond and Dam are in Lincoln Woods State Park and the pond is utilized as a recreational facility. A park roadway passes over the dam's wide embankment, which varies in width from 80 to 130 ft. Some of the Park facilities are built on the crest of the embankment. The pond is about 4,000 ft. long and has a surface area of 127 acres at spillway crest level. The drainage area is 0.87 sq. mi. (557 acres) and the maximum storage to top of dam is 1,860 acre-ft.; the size classification is thus intermediate. Because a breach of the dam could flood out several homes and industrial complexes, and at least two State highways, with the possibility of the loss of more than a few lives and the probability of excessive economic losses, it has been classified as having a high hazard potential.

Based upon the guidelines, the recommended test flood is a full PMF (intermediate size, high hazard). The test flood inflow equals about 2,400 cfs. The routed test flood outflow (1,130 cfs) overtops the dam embankment by about 1.5 ft. The spillway can pass about 88 cfs or about 8 percent of the routed test flood outflow without overtopping the embankment. The facility can handle a 0.45 PMF event without overtopping the dam.

The dam was judged to be generally in good condition. However, tree growth and other vegetation were abundant on the downstream buttress area of the dam. Two zones of seepage were found on the downstream side of the embankment, one zone being at the end of the low level outlet. The spillway is not adequate to pass the routed test flood outflow.

Within two years after receipt of this Phase I Inspection Report, the owner, the State of Rhode Island, Department of Environmental Management, should retain the services of a registered professional engineer and implement the results of his evaluation of the following: (1) assess further the potential for overtopping and the adequacy of the spillway; (2) investigate the source of the relatively high flow issuing at the end of the 24 in. low level outlet pipe; (3) investigate the seepage at the toe of the dam; and (4) investigate the desirability of clearing mature trees from east of the park road crossing the embankment.

The owner should also implement the following operating and maintenance measures: (1) clear undergrowth and vines from the face of the downstream retaining wall and buttress; (2) clear stands of trees and brush from the zone immediately downstream of the wall; (3) monitor, at least once per month, the seepage issuing from below the toe of dam and the flow issuing at the end of the 24 in. low level outlet pipe; (4) modify spillway trashrack to facilitate removal in anticipation of flood flows; (5) develop a formal flood warning and surveillance plan, including round-the-clock monitoring during periods of heavy rainfall; and (6) institute procedures for a biennial periodic technical inspection of the dam and its appurtenant structures.

Peter B. Dyson
Project Manager

This Phase I Inspection Report on Olney Pond Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and is hereby submitted for approval.

Joseph W. Finegan

JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

Joseph A. McElroy

JOSEPH A. MCELROY, MEMBER
Foundation & Materials Branch
Engineering Division

Carney M. Terzian

CARNEY M. TERZIAN, CHAIRMAN
Chief, Structural Section
Design Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation: however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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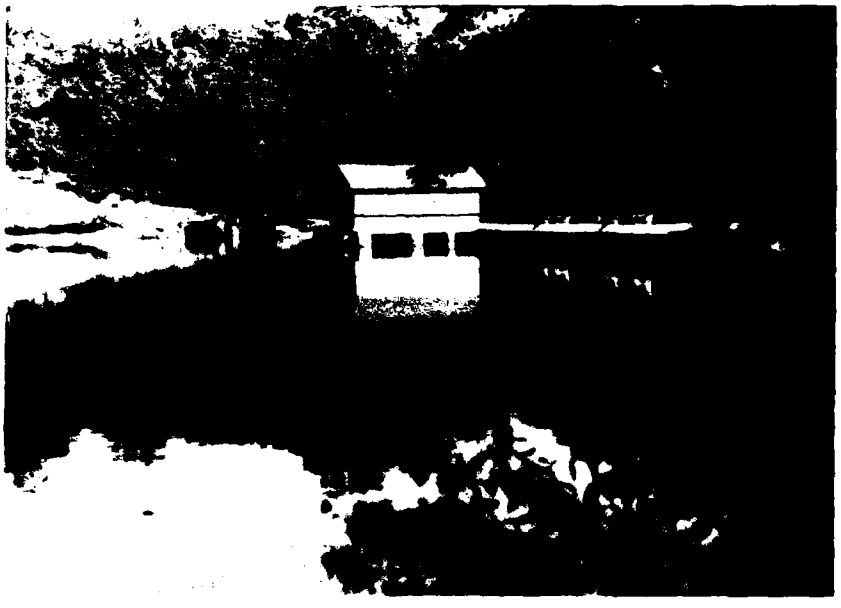
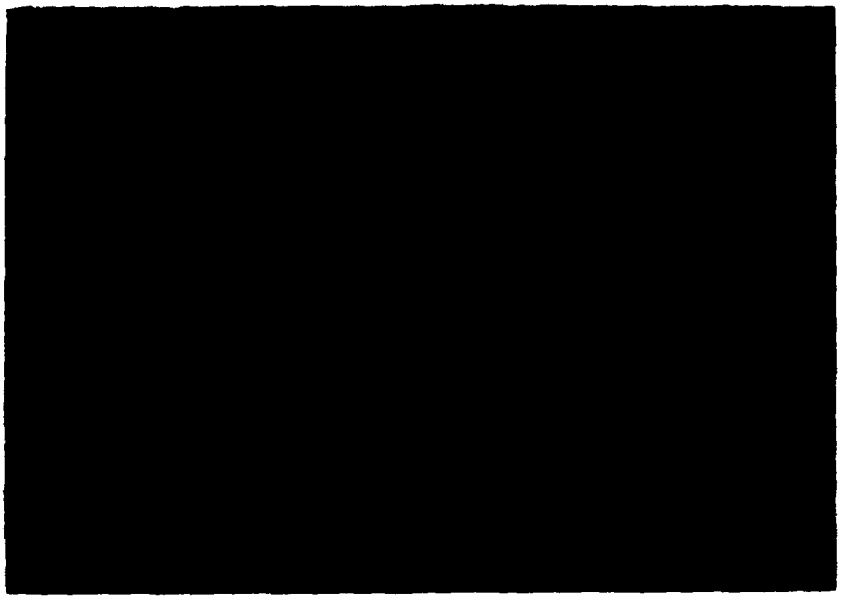
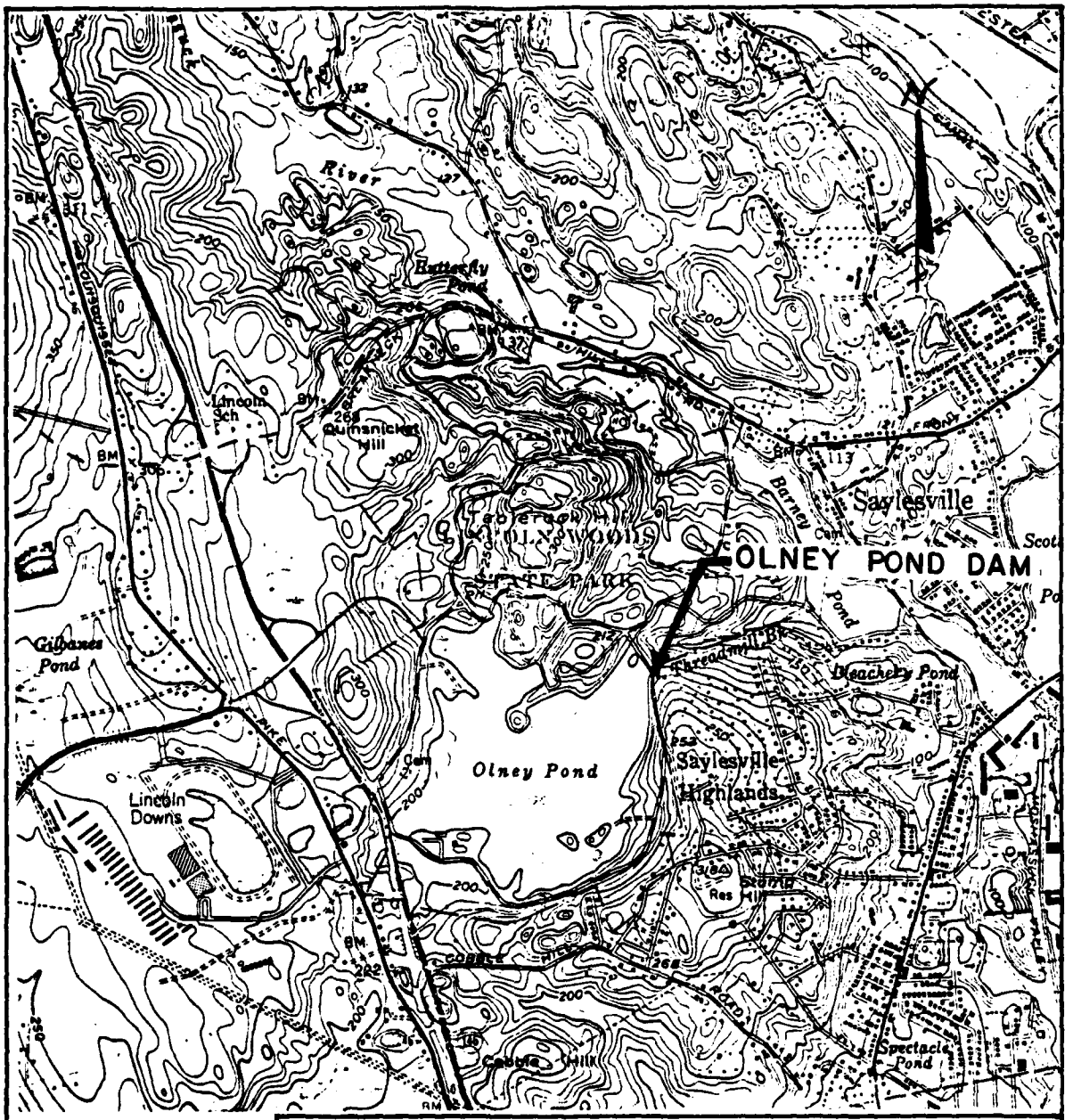


Overview of spillway entrance, gate house and upstream face of dam from right abutment.



Overview of dam embankment from right abutment.



LOUIS BERGER & ASSOC., INC WELLESLEY, MASS. ARCHITECT · ENGINEER	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

OLNEY POND DAM

PAWTUCKET QUADRANGLE

PROVIDENCE RIVER BASIN STATE - RI

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			DATE

PHASE I INSPECTION REPORT

OLNEY POND DAM RI 01702

SECTION I - PROJECT INFORMATION

1.1 General

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Louis Berger & Associates, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Rhode Island. Authorization and notice to proceed was issued to Louis Berger & Associates, Inc. under a letter of 14 August 1979 from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-79-C-0051, Job Change No. 1, has been assigned by the Corps of Engineers for this work.

b. Purpose

(1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

(2) Encourage and assist the States to initiate quickly effective dam safety programs for non-Federal dams.

(3) Update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location. Olney Pond Dam is located in Providence County in the Town of Lincoln in northeastern Rhode Island. Olney Pond forms the headwaters of Threadmill Brook approximately one-half mile upstream from the confluence of Threadmill Brook and the Moshassuck River. Olney Pond is a recreational body of water located in Lincoln Woods State Park. The dam is reached via State Route 145 and Breakneck Hill Road. It is shown on U.S.G.S. Quadrangle, Pawtucket, Rhode Island - Massachusetts with coordinates approximately at N 41° 53' 41", W 71° 25' 37".

b. Description of Dam and Appurtenances

(1) Description of Dam. The dam is an earth embankment closing off the outlet channel of Olney Pond. The dam is about 29.5 ft. high and about 220 ft. long, of earthfill construction with a stone masonry core wall. It is supported by a buttress on its downstream face, constructed of stone with unmortared joints, which is about 220 ft. long. The center portion of the stone wall buttress is the uppermost and largest step, being about 78 ft. long and 10 ft. wide. The steps diminish in size as they approach the toe of the dam. The upstream face of the

dam consists of a concrete masonry wall which rises about 2.3 ft. above the normal surface of the water. The width of the dam varies from about 80 ft. at the north end to about 130 ft. at the south end. A park roadway passes across the dam from one end to the other and park benches are located on the crest near the upstream face of the dam.

(2) Spillway. The spillway for Olney Pond Dam is located about 30 ft. west of the dam and consists of a curved tunnel cut in ledge rock. The tunnel is about 120 ft. long and outlets in a stone lined channel. The entrance of the tunnel is 7 ft. wide and 4 ft. high. The tunnel tapers in both width and height to a width of 5 ft. and a height of 2.5 ft. as the tunnel floor drops about 9 ft. in elevation from entrance to exit. The park roadway passes over the spillway tunnel just upstream from its outlet. Beyond the tunnel, spillway discharges flow into the stone lined channel and then cascade down a steep embankment.

(3) Outlets. The low level outlet for Olney Pond Dam is located near midspan of the dam where a 10 ft. x 16 ft. wooden gate house is located. A 24 in. dia. circular conduit about 200 ft. long extends from the gate house to the downstream toe of the dam. Flows through the conduit are controlled by a gate located in the gate house. It is not known whether the gate is rectangular or circular. The outlet end of the conduit discharges into a manmade channel.

c. Size Classification. Olney Pond Dam is about 29.5 ft. high, impounding a storage of 1,490 acre-ft. to spillway crest level and about 1,860 acre-ft. to top of dam. In accordance with size and capacity criteria promulgated in the Recommended Guidelines for Safety Inspection of Dams, the capacity criteria governs and the project is categorized in the intermediate classification.

d. Hazard Classification. A breach failure of Olney Pond Dam would release water down the one-half mile length of Threadmill Brook to its confluence with the Moshassuck River at Barney Pond. Though no structures are located along Threadmill Brook, the area beyond the confluence of Threadmill Brook and Moshassuck River is extensively built up, with homes adjacent to about two thirds of the Barney Pond shoreline. Immediately below Barney Pond Dam is Bleachery Pond, controlled by a dam at a mill complex about one-half mile below the Barney Pond Dam. A busy local road passes just below Barney Pond Dam and State Highway 126 crosses Bleachery Pond; it is anticipated that both these roadways would be flooded out by a breach of Olney Pond Dam. Beyond the mill complex at Bleachery Pond Dam the banks of the Moshassuck River are completely built up as the river threads its way through the cities of Central Falls, Pawtucket and Providence, before emptying into Providence Harbor.

A breach of Olney Pond Dam would cause a water rise of about 4.3 ft. in Barney Pond and about a 10 ft. rise in Bleachery Pond. This inundation would submerge more than 14 homes along the right bank of Bleachery Pond and adjacent to State Highway 126. The mill building at Bleachery Pond Dam would be flooded severely. In the reach below Bleachery Pond Dam the river has been rechannelized through a relatively small channel. It is estimated that damages to commercial and industrial establishments adjacent to the channel would also be extensive. It is

therefore considered that more than a few lives would be lost because of a breach of the dam and that economic losses would be excessive. Consequently, Olney Pond Dam has been classified as having a high hazard potential in accordance with the Recommended Guidelines for the Safety Inspection of Dams.

e. Ownership. The dam is owned by the State of Rhode Island Department of Environmental Management, 83 Park Street, Providence, Rhode Island. Records indicate that the dam was owned by the Sayles Finishing Plant, Inc. of Saylesville, R.I. at least through the years 1947-1949.

f. Operator. George Langley, Park Manager, Lincoln Woods State Park, Lincoln, Rhode Island. Telephone (401) 723-7892.

g. Purpose of Dam. The dam impounds a body of water used for recreational purposes.

h. Design and Construction History. It is not known by whom the dam was designed and constructed or when it was constructed, but records indicate that the facility existed in 1883 and was known as Stump Hill Reservoir and Dam at that time. A 1978 inspection report by the State of Rhode Island, Department of Environmental Management, states that the most recent reconstruction of the dam took place in 1912 and 1913, when the gate house and spillway were reconstructed. From the 1912 cross sections of the dam, it appears that the dam was also widened. An 1885 report states that the spillway was once located in the vicinity of the present stepped stone buttress to the downstream slope. Records also indicate that the gate house received repairs in 1978 and at that time the gate was in good working condition.

i. Normal Operating Procedure. There are no formal operating procedures for Olney Pond Dam. The pond is occasionally drawn down to permit maintenance work on the recreational beaches. A trash rack at the entrance to the spillway is periodically cleaned of debris. Trees and other vegetation are allowed to grow on the wide crest of the earth embankment, but growth is controlled.

1.3 Pertinent Data

a. Drainage Area. The drainage area contributing to Olney Pond is situated at the headwaters of Threadmill Brook. The drainage area encompasses a total of about 0.87 sq. mi. (557 acres), of which 127 acres are occupied by the pond. The longest circuitous stream course contributing to the pond is about 4,000 ft. long, with an elevation difference of about 104 ft. or at a slope of about 139 ft. per mile. The drainage area has a length of about 1.25 miles and a maximum width of about 0.87 mile. The basin consists of both open fields and forested areas, most of the area being forested; it has a sparse population.

b. Discharge at Damsite

(1) Outlet Works Conduit. Low level discharge from Olney Pond Dam is provided for by a 24 in. dia. circular conduit through the dam controlled by a slide gate located in a gate house structure over a masonry wet well. The invert elevation of the outlet pipe could not be determined as there is no record of its elevation. Based on the elevation at the outlet end, an elevation of 182 MSL was

assumed for the inlet invert. On this basis, it is estimated that the conduit has the ability to discharge about 102 cfs when the water level is at the top of the dam and the slide gate is fully open.

(2) Maximum Known Flood at Damsite. No records are available of flood inflows into Olney Pond, nor of spillway releases and surcharge heads during such inflows.

(3) Ungated Spillway Capacity at Top of Dam. The total spillway capacity at the top of dam, elevation 198.6, is 88 cfs (neglecting the effect of the trashrack).

(4) Ungated Spillway Capacity at Test Flood Elevation. The ungated spillway capacity is about 180 cfs at test flood elevation 200.1.

(5) Gated Spillway Capacity at Normal Pool Elevation. Not applicable

(6) Gated Spillway Capacity at Test Flood Elevation. Not applicable

(7) Total Spillway Capacity at Test Flood Elevation. The total spillway capacity at the test flood elevation is the same as (4) above, 180 cfs at elevation 200.1 MSL.

(8) Total Project Discharge at Test Flood Elevation. The spillway is inadequate to handle the test flood and the dam would be overtopped by 1.5 ft. at elevation 200.1 MSL. The total discharge through the spillway and over the dam would be about 1,130 cfs.

c. Elevations (Ft. above NGVD)

(1) Streambed at centerline of dam - 169.1(+)

(2) Maximum tailwater - Not available

(3) Upstream invert of outlet pipe - 182 (approximately)

(4) Recreational Pool - Not applicable

(5) Full flood control pool - Not applicable

(6) Ungated spillway crest - 196.0

(7) Design surcharge (original design) - Unknown

(8) Top of dam - 198.6

(9) Test flood design surcharge - 200.1

d. Reservoir

(1) Length of maximum pool - 4,000 ft.

(2) Length of recreation pool - Not applicable

(3) Length of flood control pool - Not applicable

e. Storage (acre-ft.)

(1) Recreation pool - Not applicable

(2) Flood control pool - Not applicable

(3) Spillway crest pool El. 196.0 - 1,490

(4) Top of dam El. 198.6 - 1,860

(5) Test flood pool El. 200.1 - 2,100

f. Reservoir Surface (acres)

(1) Recreation pool - Not applicable

(2) Flood control pool - Not applicable

(3) Spillway crest El. 196.0 - 127.0

(4) Top of dam El. 198.6 - 156.0

(5) Test flood pool El. 200.1 - 172.5

g. Dam

(1) Type - Earthfill embankment

(2) Length - 220 ft.

(3) Height - 29.5 ft.

(4) Top width - varies - 80 ft. to 139 ft.

(5) Side slopes - Upstream unknown
Downstream vertical stepped buttress

(6) Zoning - Unknown

(7) Impervious core - Stone wall

(8) Cutoff - Sheet piling

(9) Grout curtain - Unknown

(10) Other - Not applicable

h. Diversion and Regulating Tunnel - None

i. Spillway

(1) Type - 7 ft. wide x 4 ft. high tunnel cut in ledge
Tapers to 5 ft. wide x 2.5 ft. high at outlet

(2) Length of weir - 7 ft.

(3) Crest elevation - 196.0 MSL

(4) Gates - None

(5) Upstream channel - Natural pond

(6) Downstream channel - Stone lined channel

(7) General - Spillway entrance fitted with trashrack having closely spaced bars.

j. Regulating Outlets

(1) Invert - 182.0 NGVD (approximate)

(2) Size - one 24 in. dia. pipe

(3) Description - 200 ft. long circular conduit through gate house.

(4) Control Mechanism - 24 in. slide gate in wet well at gate house.

(5) Other - Not applicable

SECTION 2 - ENGINEERING DATA

2.1 Design Data

No data on the design of the original dam or appurtenances has been recovered and probably none exist. Three plans pertaining to the 1912-1913 reconstruction of the dam appear in Appendix B of this report. The designers of the original dam and the 1912-1913 reconstruction work are not known. The 1912-1913 plans indicate that the dam was significantly modified by the reconstruction, including widening of the embankment with a masonry cutoff wall, extension of the outlet conduit with new gate and gate house, and reconstruction of the spillway.

2.2 Construction Data

No records or correspondence regarding the construction or reconstruction of the dam have been found.

2.3 Operation Data

The dam is operated by Lincoln Woods State Park personnel. There appear to be no formal records.

2.4 Evaluation

a. Availability. Since no significant engineering data is available, it is not possible to make an assessment of the safety of the embankment. The basis of the information presented in this report is principally the visual observations of the inspection team.

b. Adequacy. The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgement.

c. Validity. Not applicable

SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General. The visual inspection of Olney Pond Dam took place on 22 and 23 August 1979. On 22 August the water was about 3½ in. above the spillway crest. The discharge through the spillway was estimated to be about 3 cfs. There was no evidence of any major maintenance problems, but some items require attention (see Sections 7.2 & 7.3). The dam generally was judged to be in good condition.

b. Dam. The dam, situated at the east end of Olney Pond in Lincoln Woods State Park, is a broad 220 ft. long embankment from 80 ft. to 130 ft. wide, upon which a road and some park facilities have been built. The dam is 29.5 ft. high at the deepest point downstream. A 220 ft. long stone wall is located on the downstream side, reinforced by a massive stepped masonry buttress about 78 ft. long and 30 ft. wide.

A 190 ft. long, low concrete wall, with about 2.3 ft. of freeboard, is on the upstream side of the dam (Appendix C, Photo Nos. 1 & 2). To the north (left), the upstream wall ties to a rock abutment, and to the south (right) it ties into a 12 ft. wide sandy boat launching ramp, beyond which are many rock outcrops. The earth embankment, consistent with its function as part of a park, was well tended. On the upstream side, the concrete and stone masonry was in good condition with no evidence of serious spalling, dislodgement, or displacement. Many mature shade trees lined the downstream side of the road, several very close to the downstream retaining wall (Appendix C, Photo No. 3). On the downstream side of the dam, the stone masonry wall and reinforcing buttress also seemed to be in good condition, but the latter is so densely covered with brush, vines, and similar undergrowth that a detailed inspection could not be made.

Two areas of seepage or leakage were identified on the downstream side. Immediately below the center of the buttress area, a shallow pool, orange with algae and iron, discharges at about 0.5 to 1.0 gpm (Appendix C, Photo No. 4). It is of interest to note that in this same area, drawings dated 1912 show a "brook" issuing from beneath the buttress. Further, an early report (Appendix B) entitled "Copy of Full Report as Contained in Yearly Reports of Commissioners of Dams and Reservoirs" refers to this flow in 1885 as follows:

> "A counterfort of masonry in massive proportions supports the retaining wall at its highest point from the base of which issues an active stream of water whose origin has not been determined. Its actions are carefully observed. The reservoir has no rollway providing for the discharge of surplus water and the only provision for that purpose is through an iron cylinder of two feet in diameter and controlled by gate."

The report was made before the 1912-1913 reconstruction; it is thus seen that the seep has an unusually long documented history.

A second source of abnormal flow was at the outlet of the dam's 24 in. drawdown pipe, which discharges about 70 ft. east of the downstream wall (Appendix C, Photo No. 5). The flow discharges into a channel between a natural ridge to the south and what appears to be a constructed dike to the north, evidently designed to deflect drawdown flows from the dam toe. The elevation of this channel is about 16 ft. below dam crest. The flow was clear, but of a rather high volume estimated at about 5 gpm, considering that the gate was closed at the time.

c. Appurtenant Structures. The spillway for Olney Pond Dam is located 30 ft. west of the earth embankment and consists of a curved tunnel cut in ledge rock. The tunnel is about 120 ft. long and outlets into a stone lined channel (Appendix C, Photo No. 6). The entrance to the tunnel is 7 ft. wide and 4 ft. high. A closely spaced bar trash rack is located across the entrance of the tunnel, which restricts the flow through the spillway (Appendix C, Photo No. 7). The tunnel tapers in both width and height to a width of 5 ft. and a height of 2.5 ft. as the tunnel floor drops about 9 ft. in elevation from entrance to exit. The spillway discharges into a steep gorge, the origin of Threadmill Brook. Just upstream from the outlet the spillway tunnel passes under the park roadway. The spillway appeared to be in good condition.

The low level outlet for Olney Pond Dam is located near mid-span of the dam where a 10 ft. x 16 ft. wooden gate house is located (Appendix C, Photo No. 8). The house contains a 24 in. slide gate which controls flows through a 24 in. dia. conduit that passes through the dam embankment and exists at a point about 70 ft. downstream of the embankment retaining wall. The outlet conduit is fitted with masonry seepage cutoffs located in the earth embankment. According to Park personnel the elevation of the inlet invert is not known. The outlet facility is not operated on a day to day basis, but is usually opened in the fall to draw down the pond for maintenance purposes. On the second day of the inspection the Park personnel operated the gate; opening the gate, there was a noticeable increase in flow downstream at the outlet. It was reported that a diver was sent down last year to locate the inlet invert and inspect the gate, but was unable to find the inlet. Though the condition of the portion of the facility below water is unknown, that part of the facility above water appeared to be in good condition.

d. Reservoir Area. The reservoir area is the headwaters of Threadmill Brook. Except for a few beach areas the shores of the pond are largely dominated by rock outcrops, and are stable.

e. Downstream Channel. The outlet of the spillway discharges into a steep ravine which drops about 120 ft. in a distance of one-half mile, at which point Threadmill Brook joins the Moshassuck River at Barney Pond. The Barney Pond area is extensively built up, with houses adjacent to about two-thirds of the Barney Pond shoreline. Just below Barney Pond is Bleachery Pond, which is controlled by a dam at a mill complex located about one-half mile below the Barney Pond Dam. Beyond the mill complex, the banks of the Moshassuck River are completely built up as the channelized river threads its way through the cities of Central Falls, Pawtucket and Providence, before emptying into Providence Harbor.

3.2 Evaluation

In general the visual inspection of the dam adequately revealed key characteristics of the project as they may relate to its stability and integrity, permitting an assessment to be made of those features affecting the safety of the structure. The spillway opening is not adequate to pass high flows. Trees and other growth should be cleared from certain areas of the dam and seepage was observed at two different points along the toe of the dam. The Olney Pond Dam was judged to be generally in good condition.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 Procedures

Olney Pond Dam is operated by Lincoln Woods State Park. The only operating device is one low level gated conduit through the dam. The control gate is normally kept closed, but is usually opened in the fall when the pond is drawn down for the purpose of maintaining the recreational beaches located around its perimeter. A security force patrols the grounds of the park when the gate is open.

4.2 Maintenance of Dam

Little maintenance is required except for periodic cleaning of the grating over the spillway and maintenance of the gate house and gate. This work is performed by Park forces.

4.4 Description of any Warning System in Effect

No warning system is in effect at Olney Pond Dam.

4.5 Evaluation

Although little is known about the construction of the facility, it has simple operating devices and, as such, requires no detailed operating procedures. Maintenance involves periodic debris removal from the spillway grate and surveillance regarding seeps, slope damage, animal burrows, etc. A formal warning system should be developed.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. General. Olney Pond Dam is a stone wall and earth fill structure about 29.5 ft. high which impounds a reservoir of about 1,490 acre-ft. to spillway crest and 1,860 acre-ft. to top of dam. It is basically a low surcharge-low spillage facility. The drainage basin contributing to the reservoir measures about 0.87 sq. mi. The reservoir level is controlled by a 7 ft. wide culvert type spillway with inlet sill at elevation 196.0. The top of the dam is at elevation 198.6. Drawdown of the reservoir is possible through a 24 in. dia. outlet conduit.

Olney Pond outflow is released into Threadmill Brook, which empties into Barney Pond about ½ mile downstream from the dam. Barney Pond is on the Moshassuck River, with a drainage area above the Barney Pond Dam of about 6.1 sq. mi. Barney Pond Spillway crest is at elevation 71.0, with the top of the dam at elevation 77.5. Barney Pond at spillway crest level has a surface area of about 26 acres. Surcharge storage from spillway sill to dam crest is about 200 acre-ft.

Immediately below Barney Pond Dam is Bleachery Pond, controlled by a dam at a mill building complex about ½ mile below Barney Pond. Bleachery Pond has a spillway crest at elevation 60.0 and a surface area of about 16 acres. Surcharge storage from spillway sill to dam crest, about 5 ft. higher, is about 70 acre-ft.

A busy road connecting Front Street in Saylesville and Highway 126 crosses the river immediately below Barney Pond Dam. Highway 126 crosses Bleachery Pond upstream from the mill building complex. The low point of this road crossing is about 4.5 ft. above the spillway sill level of Bleachery Pond Dam.

b. Design Data. No design data was recovered for this project.

c. Experience Data. No records are available in regard to past operation of the reservoir, or of surcharge encroachments and flows through the spillway. The maximum past inflows are unknown.

d. Visual Observations. No evidence of high water levels in the reservoir or signs of major spills were noted.

e. Test Flood Analysis

(1) Test Flood. The test flood to evaluate the hydraulic and hydrologic adequacy of Olney Pond Dam was selected in accordance with the criteria presented in the Recommended Guidelines for Safety Inspection of Dams. Since the facility is classified as intermediate in size with a high hazard potential, the recommended test flood is a full PMF.

(2) Precipitation Data. Precipitation data was obtained from Hydrometeorological Report No. 33, which for the northeastern Connecticut area approximates 24 in. of 6 hour point rainfall over a 10 sq. mi. area. This value was reduced by 20 percent to allow for basin size, shape and fit factors and an additional 2 percent for infiltration losses. The 6 hour rainfall was distributed into one hour incremental periods as suggested in COE Publication EC1110-2-1411. Net rainfall excesses for developing a runoff hydrograph are shown on Sheet D-4, Appendix D.

(3) Inflow Hydrograph. To prepare the inflow hydrograph, a triangular incremental unitgraph was adopted, using procedures as suggested in Chapter III of Design of Small Dams. Since the reservoir area comprises about a quarter of the total drainage area, the precipitation on the lake was separated from that on the overland portion. For the lake itself, the precipitation was assumed as instantaneous runoff with a rectangular incremental hydrograph. For the overland runoff, a triangular incremental hydrograph was assumed, using a lag time value of about 1½ hours to derive a time-to-peak for the triangular hydrograph of 1.62 hours (see computations on Sheets D-1 to D-5, Appendix D). For the drainage area subject to runoff, measurements were planimetered from U.S.G.S. 2,000 ft. per in. quadrangle sheets. The drainage area was estimated at 557 acres, of which 127 comprises the area of the pond. The resulting hydrograph based on the criteria noted above has a peak inflow of about 2,400 cfs and a total inflow volume of 873 acre-ft. (see Sheet D-5, Appendix D).

(4) Reservoir Areas and Capacities. Reservoir capacities below normal pond level were taken from published values. For determining surface areas and surcharge capacities, planimetered areas were taken from contours delineated on U.S.G.S. 2,000 ft. per in. quadrangle sheets. Area capacity values are shown on Sheets D-6 and D-8, Appendix D.

(5) Discharge Capacities. Spillway and dam overtopping discharges are shown on Sheet D-9. The spillway has a discharge capacity of only 88 cfs with reservoir to top of dam. Discharges over the top of the dam are based on an average length of dam of about 200 ft. Because of its small capacity, the effect of the outlet pipe was neglected.

(6) Flood Routings. A flood routing of the test flood inflow is shown on Sheet D-11, indicating a maximum routed outflow of 1,130 cfs through the spillway and over the dam, with a maximum reservoir elevation of 200.1, or 1.5 ft. over the crest of the dam. Of this outflow, about 180 cfs will be released through the spillway and 950 cfs discharged over the dam. The project will not pass the routed test flood outflow without overtopping the dam by 1.5 ft. The spillway can pass only about 8 percent of the routed test flood outflow without overtopping the dam. The facility can handle a 0.45 PMF event without overtopping the dam (Sheet D-12, Appendix D).

f. Dam Failure Analysis

(1) Breach Outflow at Olney Pond Dam. As discussed above, Olney Pond Dam would be overtopped by the routed test flood outflow. A breach from overtopping or due to structural failure of the dam from other causes is a possibility. For

the purpose of this analysis, it has been assumed that the dam fails when the reservoir level is at top of dam.

Because the hazards of potential loss of human life or property damage due to failure of Olney Pond Dam are in the reaches below Barney Pond Dam and Bleachery Pond Dam, rather than in the reach immediately below Olney Pond Dam, it was considered appropriate to adopt the following procedure for estimating the downstream flood hazards that would result from failure of the dam.

Using the "rule of thumb" criteria suggested in the NED March 1978 Guidance Report, assuming an 80 ft. average width gap and a total head from top of dam to river level of about 29.5 ft., a breach discharge curve as shown on Sheet D-9 and D-13 was developed. Assuming a progressive decay rate of ½ hour rather than an instantaneous breach, or a progressive increase rate of about 500 cfs per minute, results in a maximum breach outflow of about 16,100 cfs about 35 minutes after the start of the breach (see Sheet D-14).

As noted above, outflows from Olney Pond empty into Barney Pond on the Moshassuck River, which has a drainage area above the pond of about 6.1 sq. mi. If it is assumed that the breach at Olney Pond Dam occurs when the inflow into the reservoir is about a 0.45 PMF runoff (water level at top of dam), it would appear consistent to assume that at that time the Moshassuck River would also be in flood from that same magnitude storm.

(2) Inflow into Barney Pond. For ascertaining flood inflows into Barney Pond from the upstream Moshassuck River basin, a PMP flood hydrograph was developed (Sheets D-15 and D-16). The PMF hydrograph shows a peak inflow of 8,750 cfs and a flood volume of 5,596 acre-ft. The inflow hydrograph for a 0.45 PMF event therefore has a peak discharge of 3,940 cfs and a flood volume of 2,578 AF. Combining this river inflow with the outflow from Olney Pond Dam results in a total peak inflow of about 4,000 cfs before Olney Dam fails and of about 20,000 cfs if the dam breaches in the manner noted on Sheet D-14.

(3) Spillway and Surcharge Capacities - Barney and Bleachery Ponds. Spillway discharges and surcharge capacities at Barney Pond Dam and Bleachery Pond Dam have been computed on Sheets D-7 and D-10, Appendix D. Because of the small surcharge storages at these ponds compared with the inflow volumes, flood peaks will not be appreciably diminished as they pass through the ponds.

(4) Breach Outflow Effects Downstream. If Olney Pond Dam breaches when inflows of about 0.45 PMF are occurring into Olney and Barney Ponds, the combined outflows at Barney Pond and Bleachery Pond Dams will be about 19,930 cfs (see Case 2, Table 12, Sheet D-17).

For the above flow past Barney Pond Dam, the reservoir elevation will be about 82.6, or 4.1 ft. over top of dam (Table 8, Sheet D-10). This is at a stage about 4.3 ft. higher than that prevailing before the breach of Olney Pond Dam. A house at the southwest corner of Barney Pond would be inundated to a depth of less than 5 ft., the local road along the south side of the pond would be flooded, and several houses near the upper end of the Pond might be slightly affected.

In the case of Bleachery Pond, the water level would rise to about Elevation 78.0, a stage more than 10 ft. higher than that prevailing before the breach of Olney Pond Dam. This would inundate the area between Barney Pond and Bleachery Pond Dams to over 13 ft. above ground level adjacent to the pond. This inundation would submerge more than 14 homes along the right bank and adjacent to Highway 126 up to depths of 10 ft., the mill buildings adjacent and downstream from the Bleachery Dam, Highway 126 up to 14 ft. above roadbed, and the road immediately below Barney Pond Dam to a depth of about 12 ft.

The rechannelized reach of the Moshassuck Valley below Bleachery Pond Dam could only accommodate a flow of about 1,500 cfs or less before the banks would overflow and affect the adjacent mill buildings (see Sheet D-18, Appendix D). It is therefore apparent that flows of the order of 20,000 cfs would inundate the area to depths similar or greater than those estimated for the area above the dam, causing extensive damage to the commercial and industrial establishments occupying the adjacent buildings.

SECTION 6 - STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observation. The field investigations of the embankment revealed no significant displacement or distress which would warrant the preparation of slope stability computations.

b. Design and Construction Data. Some drawings of the 1912 reconstruction of the dam were recovered and reviewed. However, no data or calculations of value to a stability assessment for this dam were retrieved.

c. Operating Records. There are no operating records of any significance to structural stability, but flow, depth, and storage data are periodically gathered by the Lincoln Woods Park Manager and/or the State of Rhode Island's Department of Environmental Management.

d. Post Construction Changes. No post construction changes are known which would adversely affect dam stability. The spillway and embankment reconstruction about 1912 reduced adverse potentials of the original construction.

e. Seismic Stability. The dam is located in Seismic Zone No. 1, and in accordance with Phase I guidelines, does not warrant seismic analysis.

SECTION 7

ASSESSMENT, RECOMMENDATIONS & REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. On the basis of the Phase I visual examination, Olney Pond Dam appears to be in good condition. The deficiencies revealed indicate that a further investigation should be carried out and that some remedial work is needed. The major concerns with the overall integrity of the dam are as follows:

(1) The spillway will only pass about 8 percent of the routed test flood outflow without overtopping the dam.

(2) Two zones of seepage at the downstream toe of the dam.

b. Adequacy of Information. The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgement.

c. Urgency. The recommendations and remedial measures enumerated below should be implemented by the owner within two years after receipt of this Phase I Inspection Report.

d. Need for Additional Investigations. Additional investigations are required as recommended in Para. 7.2.

7.2 Recommendations

It is recommended that the owner, the State of Rhode Island, Department of Environmental Management, should retain the services of a competent registered professional engineer to make further investigations of the following, and should implement the results:

(1) Make a thorough study of the hydrology of the drainage basin and evaluate further the potential for overtopping and the adequacy of the spillway.

(2) Investigate the relatively high flow issuing from the end of the 24 in. low level outlet pipe, with particular reference to ascertaining whether the flow is derived from seepage along the pipe, infiltration into the pipe, or leakage from the gate.

(3) Investigate the desirability of incorporating a graded filter, with channelization and V-notched weir for volume monitoring of the seepage issuing from the toe of the dam.

(4) Investigate the desirability of clearing mature trees from east of the park road crossing the embankment.

7.3 Remedial Measures

a. Operating and Maintenance Procedures

(1) Clear undergrowth and vines from buttress and face of downstream retaining wall.

(2) Clear trees and brush from zone immediately downstream of wall to facilitate inspection and monitoring.

(3) Monitor, at least once per month, and after periods of high precipitation, the seepage issuing from below the toe of dam and the flow at the end of the 24 in. drawdown conduit, to observe flow characteristics and changes in turbidity.

(4) Modify spillway trash rack to facilitate removal in anticipation of flood flows.

(5) Develop a formal flood warning and surveillance plan, including round-the-clock monitoring during heavy precipitation.

(6) Institute procedures for a biennial periodic technical inspection of the dam and its appurtenant structures.

7.4 Alternatives

There are no practical alternatives to the above recommendations.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT Olney Pond Dam DATE 22 and 23 August 1979

TIME 9:30 AM

WEATHER Clear, Warm

W.S. ELEV. _____ U.S. _____ DN.S.

PARTY:

1. Peter B. Dyson
2. Carl J. Hoffman
3. James Reynolds
4. Pasquale E. Corsetti
5. Roger F. Berry
6. _____
7. _____
8. _____
9. _____
10. _____

PROJECT FEATURE	INSPECTED BY	REMARKS
1. Hydrologic	Roger F. Berry	
2. Hydraulics/Structural	Carl J. Hoffman	
3. Soils and Geology	James Reynolds	
4. General Features	Peter B. Dyson	
5. General Features	Pasquale E. Corsetti	
6.		
7.		
8.		
9.		
10.		

PERIODIC INSPECTION CHECKLIST

PROJECT Olney Pond Dam DATE 22 August 1979

PROJECT FEATURE Earth Embankment NAME

DISCIPLINE Soils and Geology NAME James Reynolds

AREA EVALUATED	CONDITIONS
DAM EMBANKMENT	
Crest Elevation	198.6
Current Pool Elevation	196.3
Maximum Impoundment to Date	Unknown
Surface Cracks	None
Pavement Condition	Satisfactory
Movement or Settlement of Crest	None
Lateral Movement	None
Vertical Alignment	Good
Horizontal Alignment	Good
Condition at Abutment and at Concrete Structures	Good
Indications of Movement of Structural Items on Slopes	None
Trespassing on Slopes	N.A. - park area
Sloughing or Erosion of Slopes or Abutments	None
Rock Slope Protection - Riprap Failures	Upstream side protected by concrete wall.
Unusual Movement or Cracking at or near Toes	None
Unusual Embankment or Downstream Seepage	See Note (1) next page
Piping or Boils	None
Foundation Drainage Features	None known
Toe Drains	None known
Instrumentation System	None known

NOTES: (1) a. Seep from toe, mid-buttress, at 1 gpm

b. Flow from end of 24 in. drawdown pipe, about 5 gpm

(2) Undergrowth and vines covering buttress; stands of trees flush with downstream wall. Encroaching brush and sapling south of buttress. Large shade trees arrayed on dam top east of road.

PERIODIC INSPECTION CHECKLIST

PROJECT Olney Pond DATE 23 August 1979

PROJECT FEATURE Gate House NAME

DISCIPLINE Engineering NAME Pasquale E. Corsetti

AREA EVALUATED	CONDITIONS
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	None
Slope Conditions	N.A.
Bottom Conditions	N.A.
Rock Slides or Falls	N.A.
Log Boom	N.A.
Debris	N.A.
Condition of Concrete Lining	N.A.
Drains or Weep Holes	N.A.
b. Intake Structure	Wooden gate house set on concrete.
Condition of Concrete	Good
Stop Logs and Slots	None

PERIODIC INSPECTION CHECKLIST

PROJECT Olney Pond Dam DATE 22 August 1979

PROJECT FEATURE Outlet Channel NAME

DISCIPLINE Hydraulics/Structural NAME Carl J. Hoffman

AREA EVALUATED	CONDITIONS
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	Outlet channel natural channel with dike constructed on north side.
Rust or Staining	
Spalling	
Erosion or Cavitation	
Visible Reinforcing	
Any Seepage or Efflorescence	
Condition at Joints	
Drain Holes	
Channel	
Loose Rock or Trees Overhanging Channel	Channel in heavily wooded area.
Condition of Discharge Channel	Reasonably clear of vegetation growth.

PERIODIC INSPECTION CHECKLIST

PROJECT Olney Pond Dam DATE 22 August 1979

PROJECT FEATURE Spillway NAME

DISCIPLINE Hydraulic/Structural NAME Carl J. Hoffman

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	None
General Condition	Entrance to spillway is obstructed by a closely spaced trash rack.
Loose Rock Overhanging Channel	N.A.
Trees Overhanging Channel	N.A.
Floor of Approach Channel	N.A.
b. Weir and Training Walls	Tunnel sluiceway with rectangular entrance.
General Condition of Concrete	Masonry - Good
Rust or Staining	None
Spalling	None
Any Visible Reinforcing	None
Any Seepage or Efflorescence	None
Drain Holes	None
c. Discharge Channel	Natural Channel
General Condition	Satisfactory
Loose Rock Overhanging Channel	None
Trees Overhanging Channel	Heavily wooded area
Floor of Channel	Natural Rock Channel
Other Obstructions	None

PERIODIC INSPECTION CHECKLIST

PROJECT: Olney Pond Dam DATE: 22 August 1979

AREA EVALUATED	CONDITIONS
Dike Embankment	N.A.
Outlet Works - Control Tower	N.A.
Outlet Works - Transition and Conduit	N.A.
Outlet Works - Service Bridge	N.A.

APPENDIX B

ENGINEERING DATA

O.K. PMJ

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

DAM INSPECTION REPORT

DAM: #102 RIVER: Threadmill Brook WATERSHED: Moshassuck DATE: 19 June 1978

NAME: Olney Pond TOWN: Lincoln INSPECTED BY: Earle Prout, Jr., and Carmine P. Asprinio cpa

OWNER: State of Rhode Island
Dept. of Environmental Mgmt.
83 Park Street
Providence, RI

OTHER INTERESTED PARTY: Manager of Lincoln Woods State Park

REASON FOR INSPECTION:

* * * * * * * * * *

REPORT:

General - Olney Pond, which is primarily spring fed, is contained almost entirely by the high natural slope of the terrain, except at the easterly end of the pond where the gatehouse and spillway are located. There it is contained by a wide earthen embankment.

The most recently reported reconstruction of the gates and spillway is dated 1912 and 1913. Otherwise, the only other renovations since then have been of a maintenance nature.

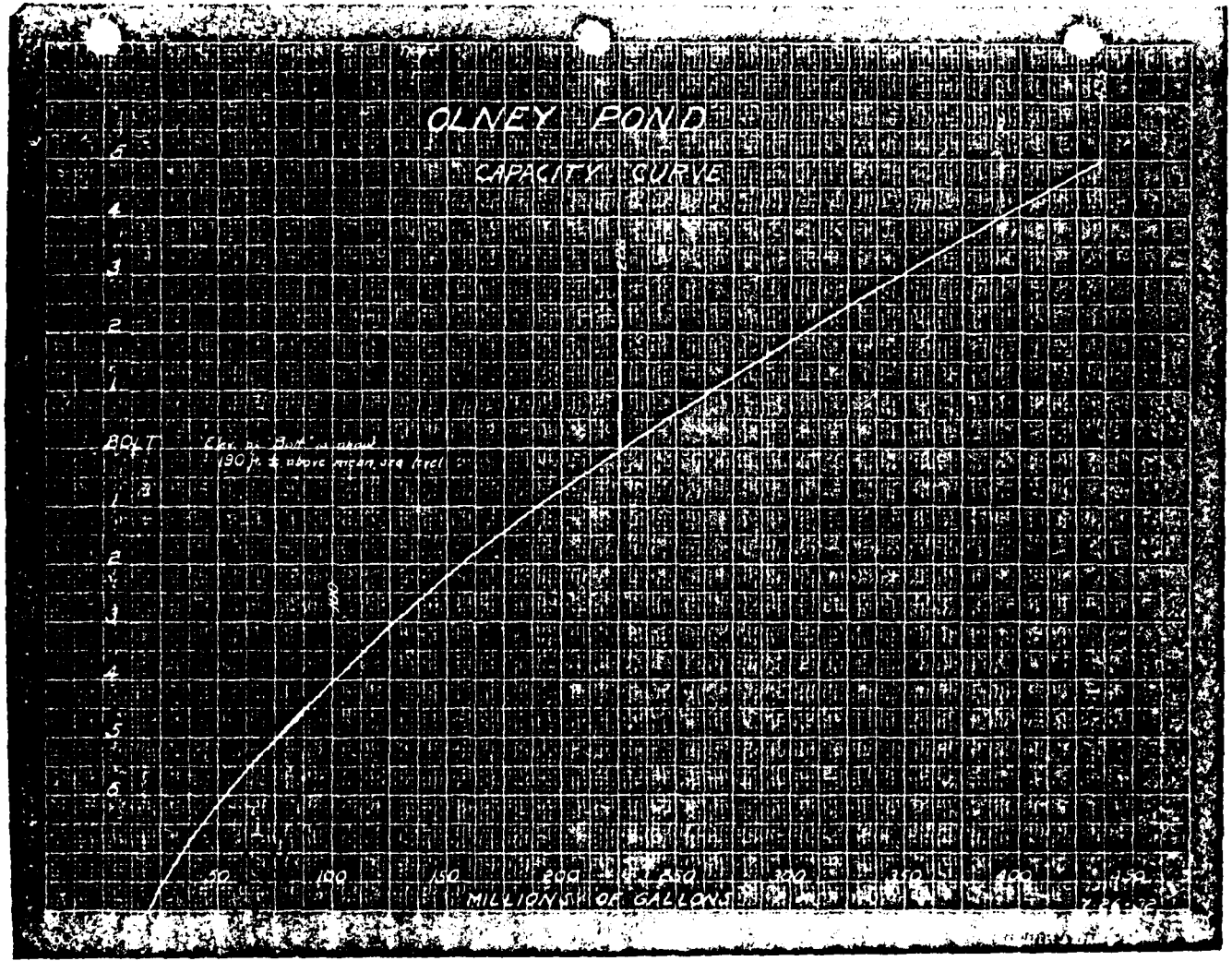
The earthen embankment is protected on the pond side by a low concrete wall and retained on the downstream side by a long stone wall, part of which is a former masonry spillway (prior to 1912) spanning a deep gorge area. There are no signs of leakage or seepage through the embankment along its entire length. This may be due, primarily, by its great width (approx. 80 feet). The paved road along the crest shows no signs of unusual settlement or cracking.

Outlet Works - (Intake) - The approach to the gatehouse and control structure is clear and unobstructed (see photos 1 & 2). The trash rack at the gate structure is clear and in good condition.

Gatehouse - The gatehouse is wooden frame construction on a masonry and concrete foundation. It is currently structurally sound, secured, and in good condition. There are no signs of spalling or scouring of the foundation. The gates are currently closed and passing no water at all. There was no demonstration as to the operability of the gate structure. Arrangements will be made to have this done in the near future. The outlet or discharge channel of the outlet works via a gorge formed through natural ledge and heavily overgrown with trees. It passes through this gorge area for approximately ½ mile, dropping in total elevation approx. 120 feet.

DEM Div. of Engineering (Subsequent note; 8/2/78) Information has been received from the Engineering Dept. that the gate structure was repaired this previous May and that they are currently in good working condition. Inspector's report is included with this report.

Additional current draw-down data will be forwarded by the Eng. Dept. as soon as available.


OLNEY POND
CAPACITY CURVE
BOLT
Elev. of Bolt on crest
190 ft. ± above mean sea level
100
150
200
250
300
350
400
450
MILLIONS OF GALLONS

MAY 22

EQUIPMENT ON PROJECT	NUMBER	DESCRIPTION OF OPERATION	TOT
[illegible] BACKHOE	[illegible]	[illegible]	
CAT DOZER [illegible]	[illegible]	[illegible]	
CAT DOZER [illegible]	—	[illegible]	
[illegible]	[illegible]	[illegible]	
FORD PICK-UP	F-60	[illegible]	?

EQUIPMENT RENTAL - ITEM	DATE IN	DATE OUT	SUPPLIER	REMARKS
JOHN DEERE	[illegible] 1973			USED TO [illegible]
BACKHOE - LOADER				[illegible]

MATERIAL RECEIVED	QUANTITY	DELIVERY SLIP NO.	SUPPLIER	USE
BOULDERS		[illegible]	FORTE BROS.	BOULDER [illegible]
				BA[illegible]

BACKCHARGES AND/OR EXTRA WORK

BY FRED COREY DEM INSPECTOR

VERBAL DISCUSSIONS AND/OR INSTRUCTIONS AT 9:00 AM 24 HRS AFTER OPENING GATE [illegible], I CHECKED WATER LEVEL. I FOUND THE LEVEL HAD DROPPED 4½" IN 24 HR PERIOD. I TOLD FORTE FOREMAN THAT SOME BOULDERS ARE TOO SMALL AND THAT THEY WILL BE REPLACED BY LARGER STONES. HE SA[ID] TO TELL JOE FORTE THIS. I ASKED JIM [illegible] TO HAVE AL [illegible] COME TO SITE AND MARK WITH PAINT THE STONES HE CONSIDERS INADEQUATE.

VISITORS TO SITE

JOB REQUIREMENTS

May 23

EQUIPMENT ON PROJECT	NUMBER	DESCRIPTION OF OPERATION	TOTAL
POCLAIN BACK-HOE	H-4	STANDING	
CAT DOZER D-[illegible]	T-7	STANDING	
CAT DOZER D-[illegible]	[illegible]	STANDING	
INGERSOLL RAND VIBRATORY [illegible]	VR-1	STANDING	
FORD PICK-UP	P-60	FOREMAN	9
CHEV SUBURBAN	RS 99765	SURVEYOR	3

EQUIPMENT RENTAL - ITEM	DATE IN	DATE OUT	SUPPLIER	REMARKS
JOHN DEERE	12 MAY 1978			PLACE [illegible]
LOADER - BACKHOE				[illegible]
				8 HRS

MATERIAL RECEIVED	QUANTITY	DELIVERY SLIP NO.	SUPPLIER	USE
BOULDERS		[illegible]	FORTE BROS	BACKFILL

BACKCHARGES AND/OR EXTRA WORK

FRED COREY
DEM INSPECTOR

VERBAL DISCUSSIONS AND/OR INSTRUCTIONS J[illegible] ARRIVED ON SITE [illegible] AM - OPENED GATE 1" [illegible] FOR TEST [illegible] OF [illegible] AT 3:30 PM - P.M.J. + RUSS [illegible] ON SITE 1:30 PM; SUGGESTED THAT THE GATE STAY OPEN 24 HOURS TO GET A BETTER IDEA OF TIME REQUIRED TO LOWER POND IN THE [illegible]. AT 3:00 [illegible] THE WATER LEVEL HAD DROPPED 1" - IN [illegible] HOURS

VISITORS TO SITE

JOB REQUIREMENTS

State of Rhode Island

INTER-DEPARTMENTAL COMMUNICATION

September 19, 19 72

To: Russell Chaufty (MEMO FOR RECORD)

Dept:

From:

Dept:

OLNEY POND DAM
102

Subject: DRAINING OF OLNEY POND FOR PHASE II CONSTRUCTION WORK

Present: Russell Chaufty
Donald Beauchemin
Rosy Laprode

Opened gate at 10:00 a.m., Monday, September 18; reading on level board on west wall of gate house = el. 13.6 feet. Opened gate 17 turns or 5" to provide an acceptable flow. From visual observation present water level is down 12" from spillway elevation. Using 8'-0" draw down as per project specifications board reading should be 6.6 feet.

Rosy is to check levels morning and night and record. Report should also include weather (rain). The gate is opened by turning the wheel in a clockwise direction. Walked stream to Barneys Pond found no noticable obstructions to flow.

RS:lmd

R. I. DEPARTMENT OF PUBLIC WORKS
DIVISION OF HARBORS AND RIVERS

DAM NO. 182

SPECIAL INSPECTION REPORT

INSPECTED BY J.V. KEILY

TOWN OF LINCOLN

DAM NO 182 NAME OLNEY POND ON BROOK / RIVER / TRENCH MOSHASSUCK RIVER WATERSHED MSK

OWNER SAYLES FINISHING PLANTS INC.

ADDRESS SAYLESVILLE, R.I. TEL. 8000

REPORT ON—NEW CONSTRUCTION REPAIRS INSPECTION ONLY X

PLANS BY APPROVED CONTRACTOR

TICKLER

SPILLWAY
TYPE
CONDITION

DRAW-OFF GATES
NUMBER
CONDITION

TRENCHES & WHEELS

EMBANKMENT
TYPE
CONDITION
APPROACHES
EROSION
BRUSHES & TREES
RIPRAP

PRESENT USE

WHO CONTROLS

WHO CONTACTED AT SITE

INSTRUCTIONS LEFT

IN EMERGENCY CALL

INSPECTION REPORT BY JVK REASON ROUTINE DATE 11/24/47

EMERGENCY CALL:

1. HORACE KILLAM, PLANT ENGINEER, 145 GREENWOOD AVENUE, EAST PROVIDENCE, R.I.
TELEPHONE EAST PROVIDENCE 1206

2. TED SANDEVILLE, ASSISTANT ENGINEER, ATTLEBORO, MASSACHUTTES TEL. ?

11/24/47 CONDITION GOOD.

LARGE NATURAL POND, HAS WIDE DIKE AND ROAD AT EAST END, HAS MASONRY RETAINING WALL ON POND SIDE. LIMITED WATER SHED. POND IS CONTROLLED BY A GATE-HOUSE OVER A 24" PIPE AND BY AN OVERFLOW SPILLWAY (4' HIGH x 7' WIDE) AT NORTHEAST CORNER OF EMBANKMENT. THIS SPILLWAY LEADS VIA CULVET UNDER ROAD TO BROOK BELOW. THE SAYLES PLANT REGULATE GATE AT TIME OF HIGH WATER. THEY HAVE WATER - RIGHTS TO THIS POND. THE OVERFLOW CULVERT NEEDS CLEARING AT EAST END - STONES NOW BLOCK FLOW - LINE.

January 1, 1949

Sayles Finishing Plants, Inc.
Saylesville, Rhode Island

Attention: Mr. H. O. Killam

Dear Mr. Killam:

We would appreciate receiving a reply to our letter of June 30, 1948 advising us as to what steps have been taken to correct conditions noted in that letter.

It will not be long before spring freshets are again due and we are required by law (Chapter 638, General Laws of Rhode Island) to notify the owners or operators of water privileges to maintain all structures in a condition to safely pass flood discharge.

Very truly yours,

DIVISION OF HARBORS AND RIVERS

John V. Kelly, Acting Chief

cc ± 97
± 98
✓ ± 10✓
± 104

June 30, 1949

Sayles Finishing Plants, Inc.
Saylesville, Rhode Island

Attention: Mr. H. G. Killam

Dear Mr. Killam:

Recent inspections at dams on the Moshassuck River under the control and operation of the Sayles Finishing Plants Corporation indicate the need of immediate attention as follows:

#97 - Butterfly Factory Dam
Embankment to west of spillway shows signs of failure. Wall is overhanging on down-stream face, fill behind same has settled causing low point in embankment below height of west abutment. General cleanup of brush needed and some of large trees should be cut.

#98 - Peace Dam
Retaining wall at side of trench near road has collapsed, needs relaying. Draw-off gate leaking, stem is not in operating condition. Embankments should be cleared of brush and trees.

#102 - Olney Pond Dam
Over-flow culvert needs clearing of stone at east end - stones now partly block ditch at run-off.

#104 - Bleachery Dam
We lack plans of this spillway and dam. We would appreciate receiving a detailed plan of spillway and draw-off pipes with data on mechanism available for operating same.

We would request that these items receive your early attention.

Very truly yours,

DIVISION OF HARBORS AND RIVERS

Frank M. O'Donnell, Chief

per _____
John V. Kelly, Engineer

3-8

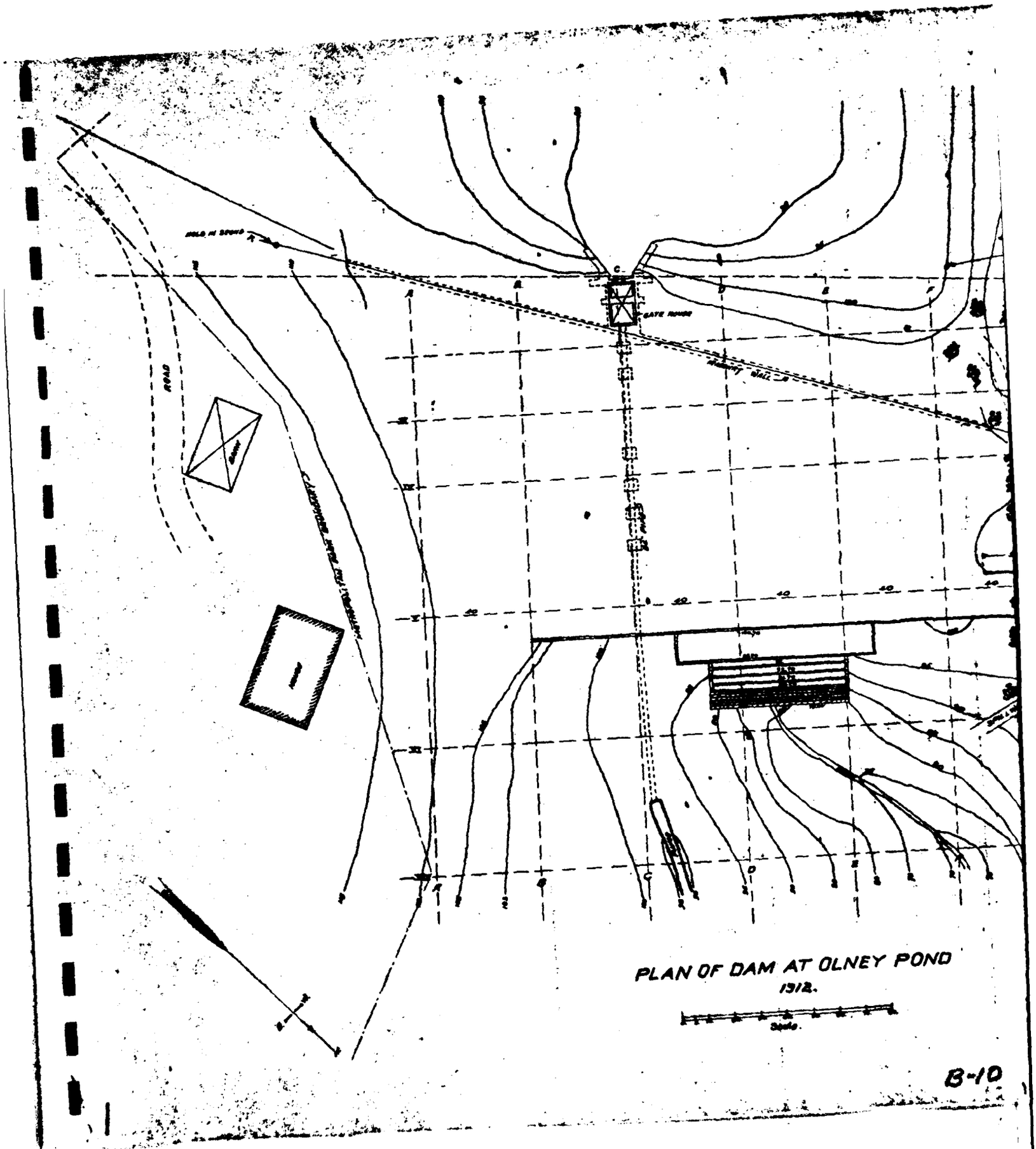
COPY OF FULL REPORT AS CONTAINED IN YEARLY REPORTS

OF COMMISSIONERS OF DAMS AND RESERVOIRS

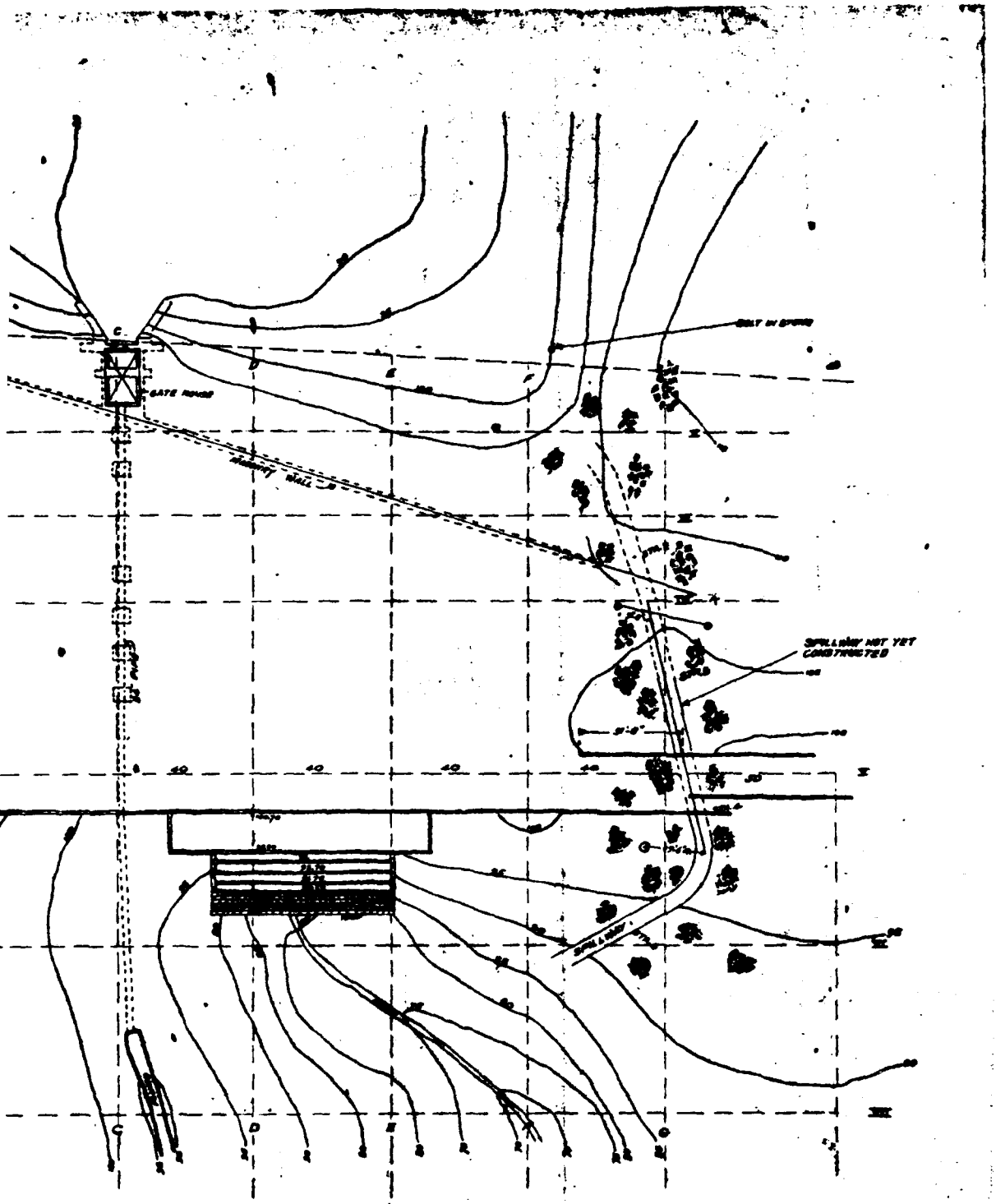
1883 - Known as Stump Hill Reservoir and dam. This is a large and important body of water discharging into the Moshassuck River near Sayle Bleachery and Dye Works. The dam is located in a narrow gorge, where is required only a small structure. The dam appears to be in a safe condition and it receives attantion from the Messrs. W. F. & F. C. Sayles.

1885 - On the map of the State this reservoir is called Olney Pond. It is a tributary to the Moshassuck River with its junction at Saylesville. It flows an area of 135 acres with depths of 16 to 20 feet at the dam. As a source of danger in case of accident, the importance of the positive security of this reservoir is scarcely surpassed by any similat structure in the State. A sudden rupture of the dam would precipitate the entire mass of water at once upon Saylesville thence down the Moshassuck Valley to the cove basin and tide water in Providence harbor, about six miles from the reservoir. The dam is an earthen structure apparently of fair material in quantities sufficient for the purpose. (other requisites being equal.) It rests in part on solid rock and the remaining part on earth. The lower side of the structure is retained throughout its entire length by a stone wall which has no indication of disturbance in any of its parts. A counterfort of masonry in massive proportions supports the retaining wall at its highest point from the base of which issues an active stream of water whose origin has not been determined. Its actions are carefully observed. The reservoir has no rollway providing for the discharge of surplus water and the only provision for that purpose is through an iron cylinder of two feet in diameter and controlled by gate. The surface of full pond is established at a point 3 feet below the crest of the dam the inner slope of which is protected by riprap. Sections of the dam are represented by disgrams in plates numbered 235 and 236.

1912 - See letters from Engineer John R. Freeman re: inquire re: filing of plans and specifications for nre dam.



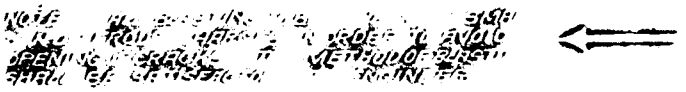
B-10

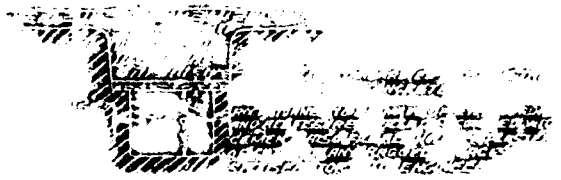


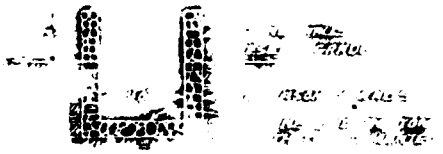
PLAN OF DAM AT OLNEY POND
1912.

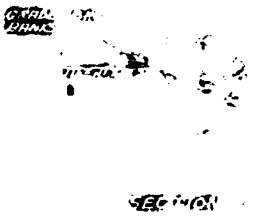
Scale.

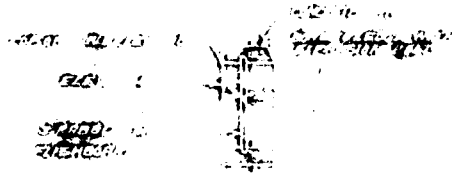
B-10, (2) Dam #102 (C 2-12)



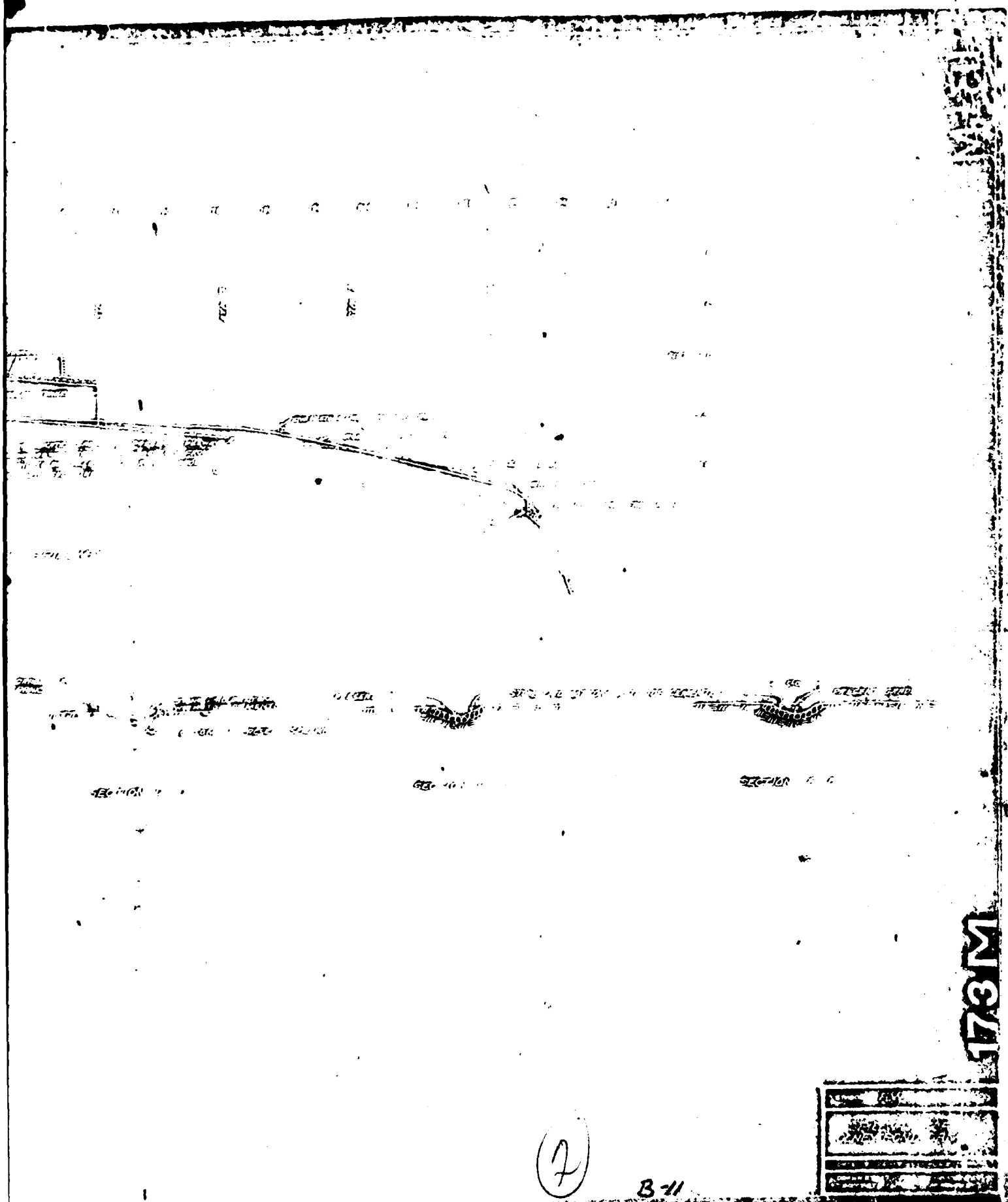


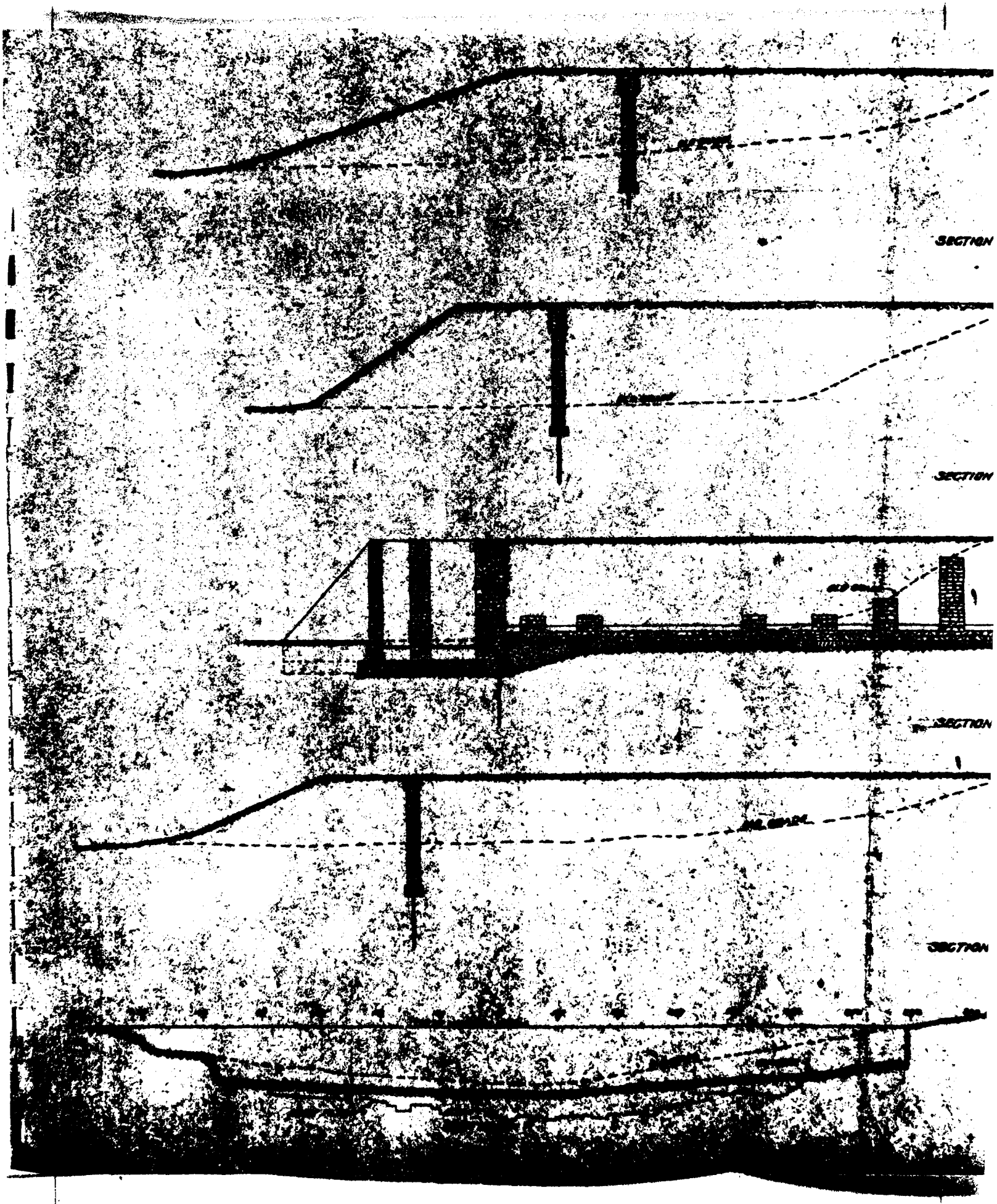






(1)

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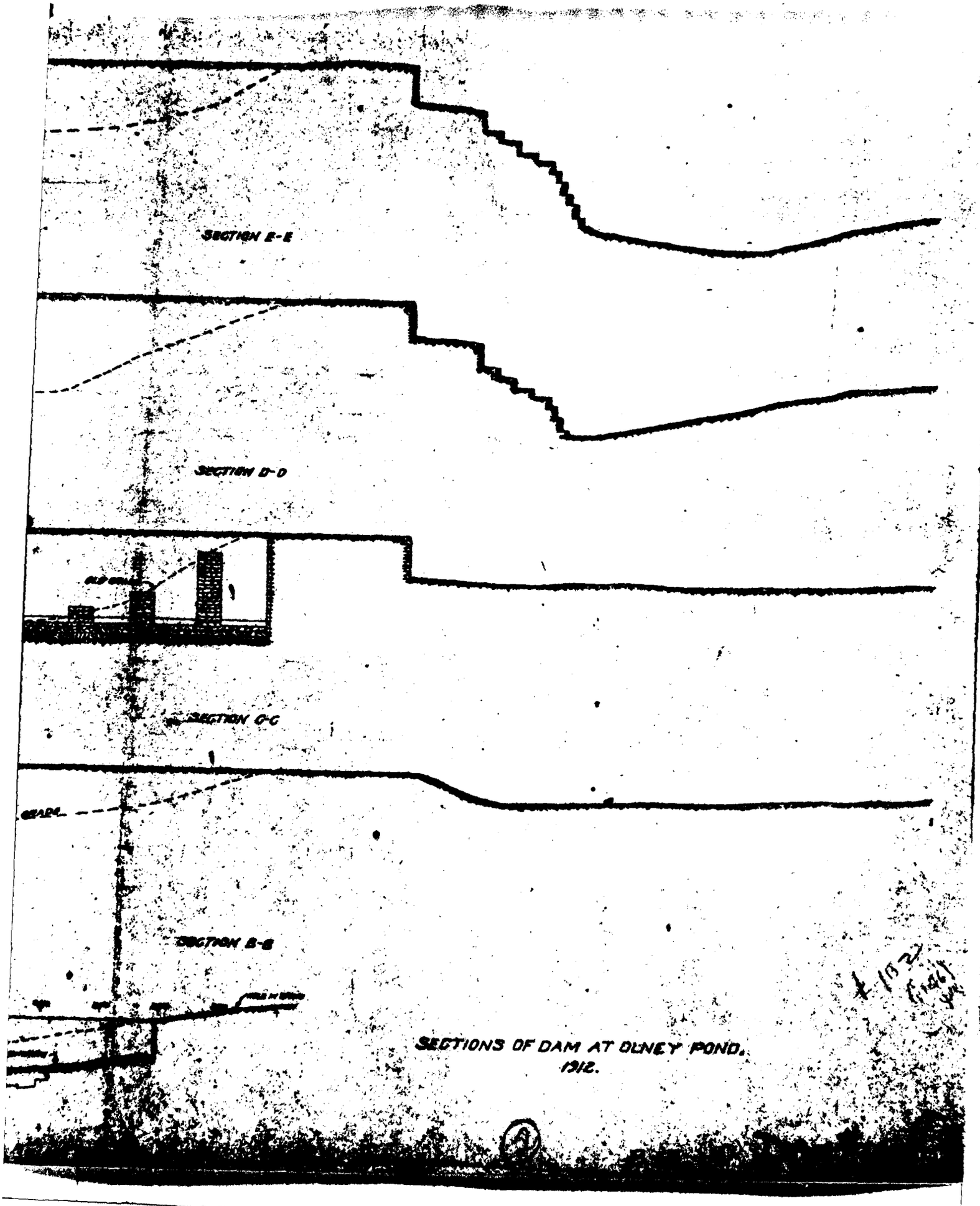
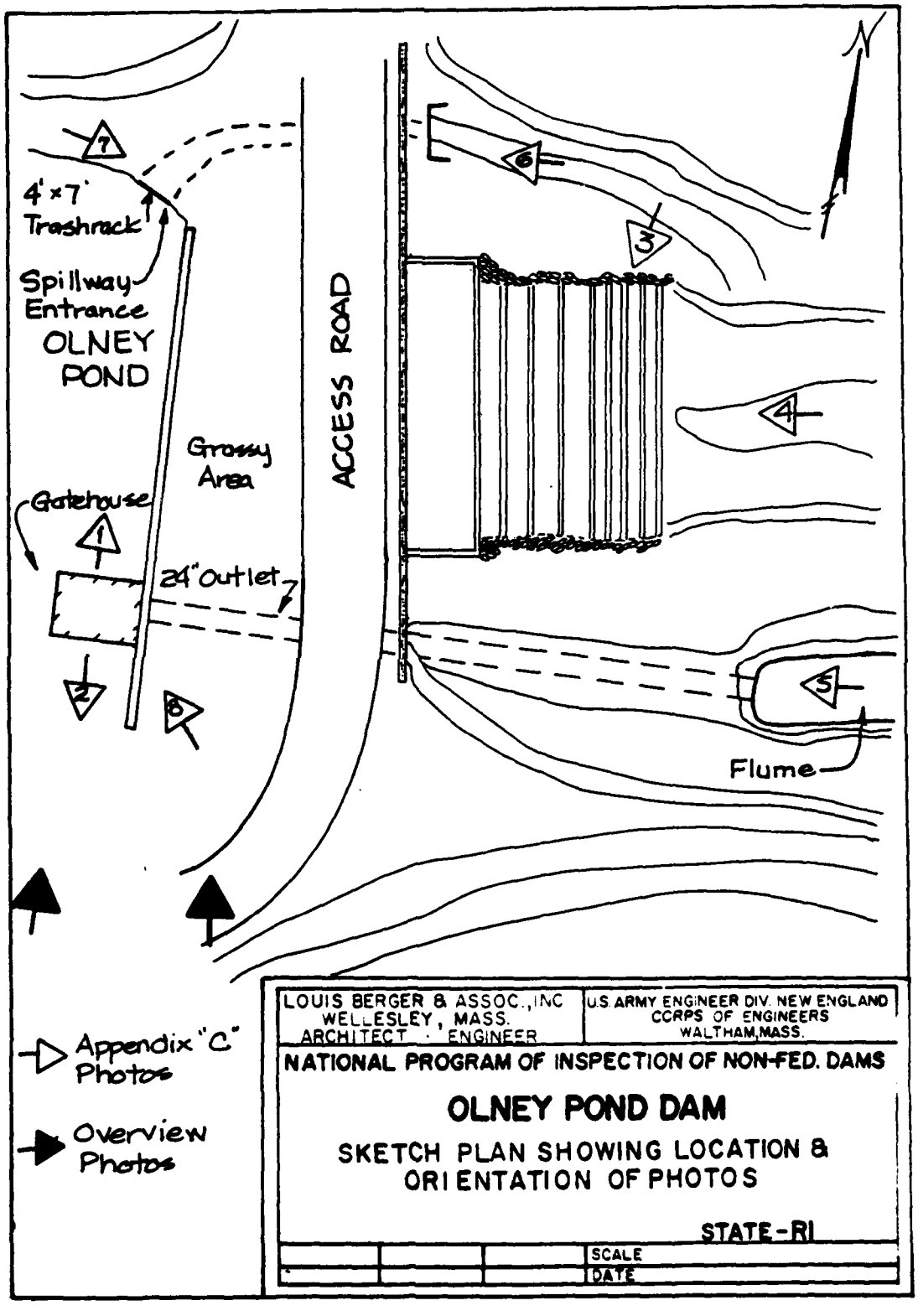


SECTIONS OF DAM AT OLNEY POND.
1912.

APPENDIX C

PHOTOGRAPHS


4'x7' Trashrack
Spillway Entrance
OLNEY POND
Grassy Area
Gatehouse
24" Outlet
ACCESS ROAD
Flume
Appendix "C" Photos
Overview Photos
LOUIS BERGER & ASSOC., INC
WELLESLEY, MASS.
ARCHITECT · ENGINEER
U.S. ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS
OLNEY POND DAM
SKETCH PLAN SHOWING LOCATION & ORIENTATION OF PHOTOS
STATE-RI
SCALE
DATE

1. Spillway entrance and upstream face of dam at north (left) abutment.

2. Boat launching ramp and upstream face of dam at south (right) abutment.

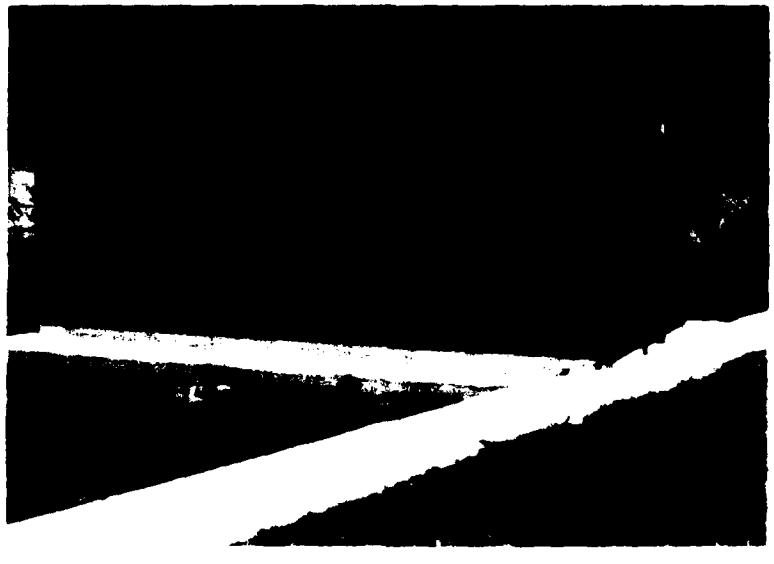
3. Downstream masonry retaining wall with masonry buttress.

4. Orange colored seepage at low point of downstream face of dam.

5. Headwall of 24 in. dia. outlet, showing clear flow of about 5 gpm when gate is in closed position.

6. Exit of spillway tunnel and discharge channel.

7. Spillway entrance with trash rack.



8. Gate house at midpoint of upstream face of dam.

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

BY JKH DATE 4/6/79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-1 OF
CHKD. BY DATE INSPECTION OF DAMS CONN. & RI. PROJECT
SUBJECT OLNEY POND - DRAINAGE AREA

FIND: ENTIRE AREA ABOVE POND

PLANIMETER No. 3651-30
INDEX @ 89.9
1.0 = 1 sq. in

U.S.G.S. Sheet	Ave Reading (sq. in.)
Pawtucket, R.I, Mass.	6.04 sq. in.

Scale: $(1")^2 = (2{,}000')^2$ 4,000,000 sq ft/sq. in

$$\text{Area} = \frac{6.04 \text{ sq in} \times 4 \times 10^6 \text{ sq ft/sq}}{43{,}560 \text{ sq ft/Acre}} = \boxed{554.64 \text{ Acres}}$$

554.64 Acres ÷ 640 Acres/sq. mi. = **0.87 sq mi**

BY RFB DATE 8-17-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO D-2 OF

CHKD. BY DATE INSPECTION OF DAMS PROJECT

SUBJECT OLNEY POND, H&H - INFLOW HYDROGRAPH

DRAINAGE AREA (TOTAL) = 0.87 SQ MI = 557 ACRES

RESERVOIR AREA @ ELEV. 196 = 0.199 SQ MI = 127 ACRES

23% OF TOTAL

∴ OVERLAND RUNOFF = 0.67 SQ MI = 430 ACRES

NOW LENGTH OF LONGEST WATER COURSE = 4000 FT
= 0.76 MI

& ELEV DIFFERENCE = 300 - 196 = 104 FT

∴ SLOPE = $\frac{104}{0.76}$ = 139 FT/MI & $\sqrt{S}$ = 11.79

NOW $\frac{LL_c}{\sqrt{S}} = \frac{(0.76)(0.76)}{2(11.79)} = .0245$

$\left(\frac{LL_c}{\sqrt{S}}\right)^{.33} = (.0245)^{0.33} = 0.294$

LAG = $K\left(\frac{LL_c}{\sqrt{S}}\right)^{.33} = .294K$

ASSUME K = 5.0 HRS (REFER TO "CURVE B", MOUNTAINOUS REGION, MIXED TERRAIN, ECKERD)

LAG = 5.0 x (.294) = 1.47 HRS

T_p = 0.41D + .82 LAG, WHERE D = 1.0 HRS

T_p = 0.41(1) + .82 (1.47)

T_p = 0.41 + 1.21 = 1.62 HRS

CHECK VELOCITY $T_c = \frac{T_p - 0.5D}{0.6} = \frac{1.62 - 0.5}{0.6} = 1.87$

$V = \frac{L}{T_c \times 3600} = \frac{4000}{(1.87)(3600)} = 0.60$ FPS OK

$T_R = 1.67\,T_p = 1.67(1.62) = 2.71$ HRS

$T_B = T_p + T_R = 1.62 + 2.71 = 4.33$ HRS

---

q_p = PEAK RATE IN CFS

$$q_p = \frac{484\,A\,Q}{T_p}$$

A = DRAINAGE AREA
Q = RUNOFF IN INCHES

$$q_p = \frac{484(0.67)(1)}{1.62} = 200 \text{ CFS}$$

COMPUTE DIRECT RUNOFF ON LAKE

$$1 \text{ IN/HR.} = \frac{1 \text{ IN } (5280 \text{ FT/MI})^2}{(12 \text{ IN/FT})(60 \text{ MIN/HR})(60 \text{ SEC/MIN}) \text{ HR}} = \frac{645.3 \text{ FT}^3/\text{SEC}}{\text{MI}^2}$$

$$1 \text{ IN/HR.} = (645.3)(0.20) = 129 \text{ CFS}$$

(1"/hr/sq mi, Area)

PMP = PROBABLE MAXIMUM PRECIPITATION

= (24")(0.8) = 19.2" FOR CONNECTICUT

= 18.8" CONSIDERING INFILTRATION FOR OVERLAND FLOW.

BY RFB DATE 8-17-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-4 OF

CHKD. BY DATE INSPECTION OF DAMS PROJECT

SUBJECT OLNEY POND, H&H, INFLOW HYDROGRAPH

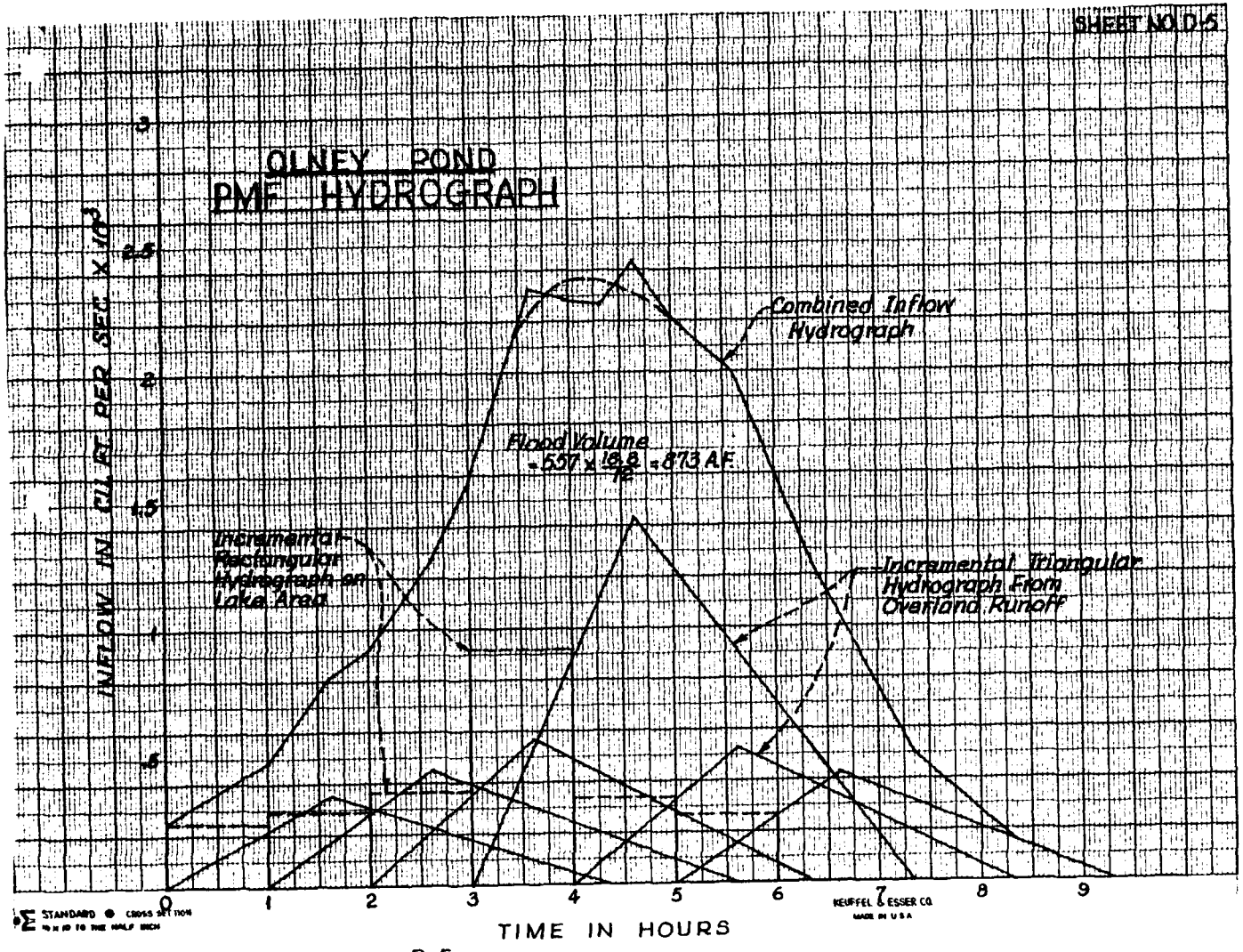
FLOOD HYDROGRAPH FOR PMF q_p = 200 CFS

TABLE 1

TIME HOURS	RAINFALL * %	RAINFALL INCHS	Qp CFS	BEGIN TIME	PEAK TIME	END TIME	DIRECT RUNOFF
0.0	-	-	-	-	-	-	-
1.0	10	1.88	376	0	1.62	4.33	248
2.0	12	2.26	452	1.0	2.62	5.33	292
3.0	15	2.82	564	2.0	3.62	6.33	364
4.0	38	7.14	1428	3.0	4.62	7.33	921
5.0	14	2.63	526	4.0	5.62	8.33	339
6.0	11	2.07	414	5.0	6.62	9.33	267

18.8

* DISTRIBUTION OF MAXIMUM 6 HOUR SPS OR PMP IN % OF 6 HOUR AMOUNT PER EM 1110-2-1411


SHEET NO. D-5
OLNEY POND
PMF HYDROGRAPH
INFLOW IN CU. FT. PER SEC. X 10³
3
2.5
2
1.5
1
.5
0
1
2
3
4
5
6
7
8
9
Combined Inflow Hydrograph
Flood Volume = 557 x 18.8/12 = 873 AF.
Incremental Rectangular Hydrograph on Lake Area
Incremental Triangular Hydrograph From Overland Runoff
KEUFFEL & ESSER CO.
MADE IN U.S.A.
STANDARD CROSS SECTION
TIME IN HOURS

BY RFB DATE 8-16-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-6 OF
CHKD. BY DATE INSPECTION OF DAMS PROJECT
SUBJECT OLNEY LAKE - CAPACITY COMPUTATIONS

TABLE 2

ELEV. FT	AREA ACRES	AVE AREA ACRES	ΔH FT	S* GAL X10⁶	ΔS ACRE FT	ΣS ACRE FT	SURCHARGE STORAGE ACRE FT
182	-	-	~	20	~	61	
183	52	49	↑	36	49	110	
184	68	58		55	58	168	
185	72	68		77	68	236	
186	82	77		102	77	313	
187	90	86		130	86	399	
188	96	93		157	83	482	
189	106	101		190	101	583	
190	122	114		227	114	697	
191	128	125		268	125	822	
192	138	129		305	174	936	
193	134	132		348	132	1068	
194	136	135	↓	392	135	1203	
195	146	141	~	438	141	1344	
196	127	144		485	144	1488	0
198	150	138.5	2		277	1765	277
200	172	161	2		322	2087	599
202	182	177	2		354	2441	953
204	195	187.5	2		375	2816	1328
210	214	208.5	6		1251	4067	
↓	212	-	-		-	-	

* from published capacity curve

AREA COMPUTATIONS

ELEV 196
READ #2 30.70 — READ #3 32.06 — AVE = 1.38
" #1 29.29 — " #2 30.70 — AREA = 127 ACRES
1.41 — 1.36

ELEV 200
READ #2 35.02 — READ #3 36.90 — AVE = 1.87
" #1 33.16 — " #1 35.02 — AREA = 172 ACRES
1.86 — 1.88

ELEV 210
READ #2 39.25 — READ #3 41.70 — AVE = 2.44
" #1 36.83 — " #2 39.25 — AREA = 224 ACRES

BY _____ DATE 8/23/79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-7 OF.
CHKD. BY _____ DATE _____ INSPECTION OF DAMS PROJECT _____
SUBJECT OLNEY POND DAM - RESERVOIR SURCHARGES

AREA - CAPACITY CURVES - OLNEY POND RESERVOIR

REFERENCE BOLT AT PROJECT DWG. El. 100 = ± El. 194 MSL
FROM CAPACITY TABLE STORAGE @ El. 100 =
@ El. 194 (MSL) = 391×10^6 gal = 1200 A.F.
@ El. 196 (Sill of spillway inlet - Capacity 485×10^6 gal = 1488 A.F.

TABLE 3
SURCHARGE STORAGE - OLNEY POND

Elev.	AREA ACRES	AVERAGE AREA Ac	Δ STORAGE A.F	Σ STORAGE A.F	REMARKS
196	127	-		0	
197	138	132.5	132.5	132	
198	150	144	144	277	← Top of dam El. 198.6 Surcharge 365 A.F.
199	161	155.5	155.5	432	
200	172	166.5	166.5	599	
201	174	175	175	774	

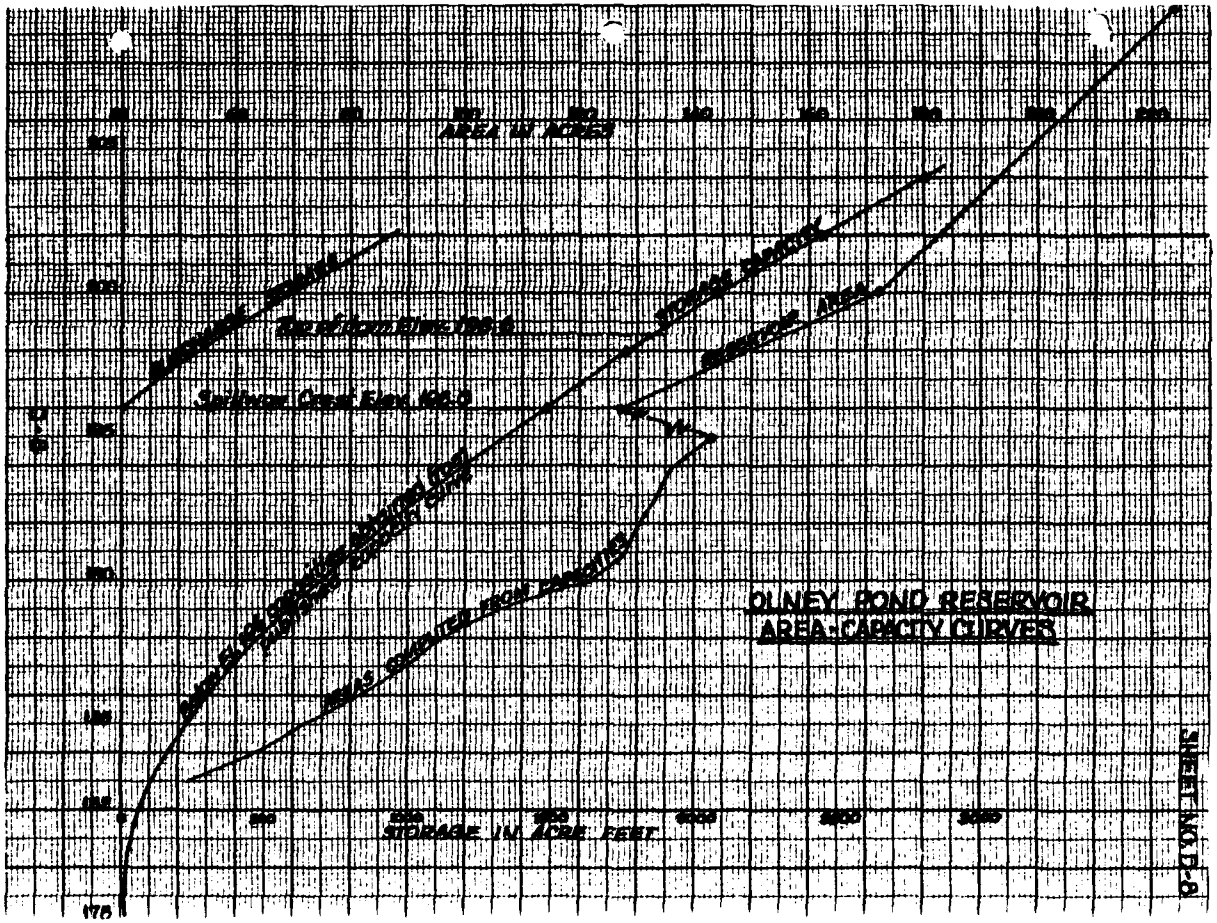
TABLE 4, AREA CAPACITY CURVES - BARNEY POND

SPILLWAY SILL ELEVATION 71 (MSL)

Elev	Measured Area Sq. in	AREA ACRES	AVERAGE AREA Ac.	Δ STORAGE A.F	Σ STORAGE A.F	REMARKS
71	0.28	26.0			0	
72		27.67	26.83	27	27	
73		29.33	28.50	28.5	55.5	
74		31.0	30.17	30	85.5	
75		32.67	31.83	32	117.5	
76		34.33	33.5	33.5	151	
77		36.0	35.17	35	186	← Top of dam El. 77.5 Surcharge storage 200 A.F
78		37.67	36.83	37	223	
79		39.33	38.5	38.5	261.5	
80	0.45	41.0	40.17	40	301.5	

TABLE 5, AREA CAPACITY CURVES - BLEACHERY POND

ELEV.	Measured Area Sq. In.	AREA ACRES	AVERAGE AREA Ac	Δ STORAGE A.F.	Σ STORAGE A.F	REMARKS
60	0.11	10			0	
70	0.25	23	16.5	165	165	← Top of overflow area upstream El. 65 Surcharge storage 70 A.F.
80	0.35	32	27.5	275	440	


OLNEY POND RESERVOIR
AREA-CAPACITY CURVES
AREA IN ACRES
STORAGE IN ACRE FEET
STORAGE CAPACITY
Spillway Crest Elev.
SHEET NO. D-8

BY ____ DATE 5/27/77 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-9 OF ____

CHKD. BY ____ DATE ____ PROJECT ____

SUBJECT OLNEY POND RESERVOIR - DISCHARGE CAPACITY & DAM OVERTOPPING ANALYSIS

OLNEY POND DAM

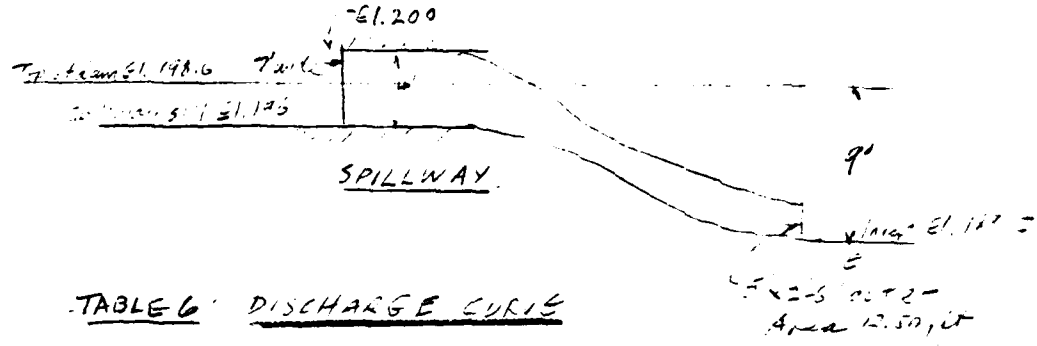
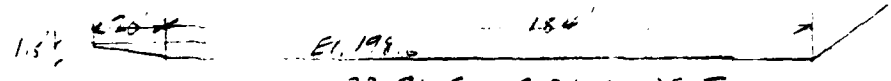


TABLE 6 DISCHARGE CURVE

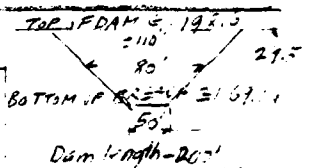
	SPILLWAY DISCH.			DAM DISCHS.			TOTAL DISCHARGE
El.	H	C	Q	H	L	C	Q	SPILLWAY + DAM
196	0	-	0					0
197	1	2.9	20					20
197.6	2	2.9	57					57
198.6	2.6	3.0	88	0	184.2	0	0	88 ← Top of dam El. 198.6
199	3	3.0	109	0.4	184.2	130		239
200	4	3.0	168	1.4	184.2	868		1036
201	5	3.0	234	2.4	200.0	2000		2234
202	6	3.0	309	3.4	220.2	3400		3709



PROFILE OF DAM CREST

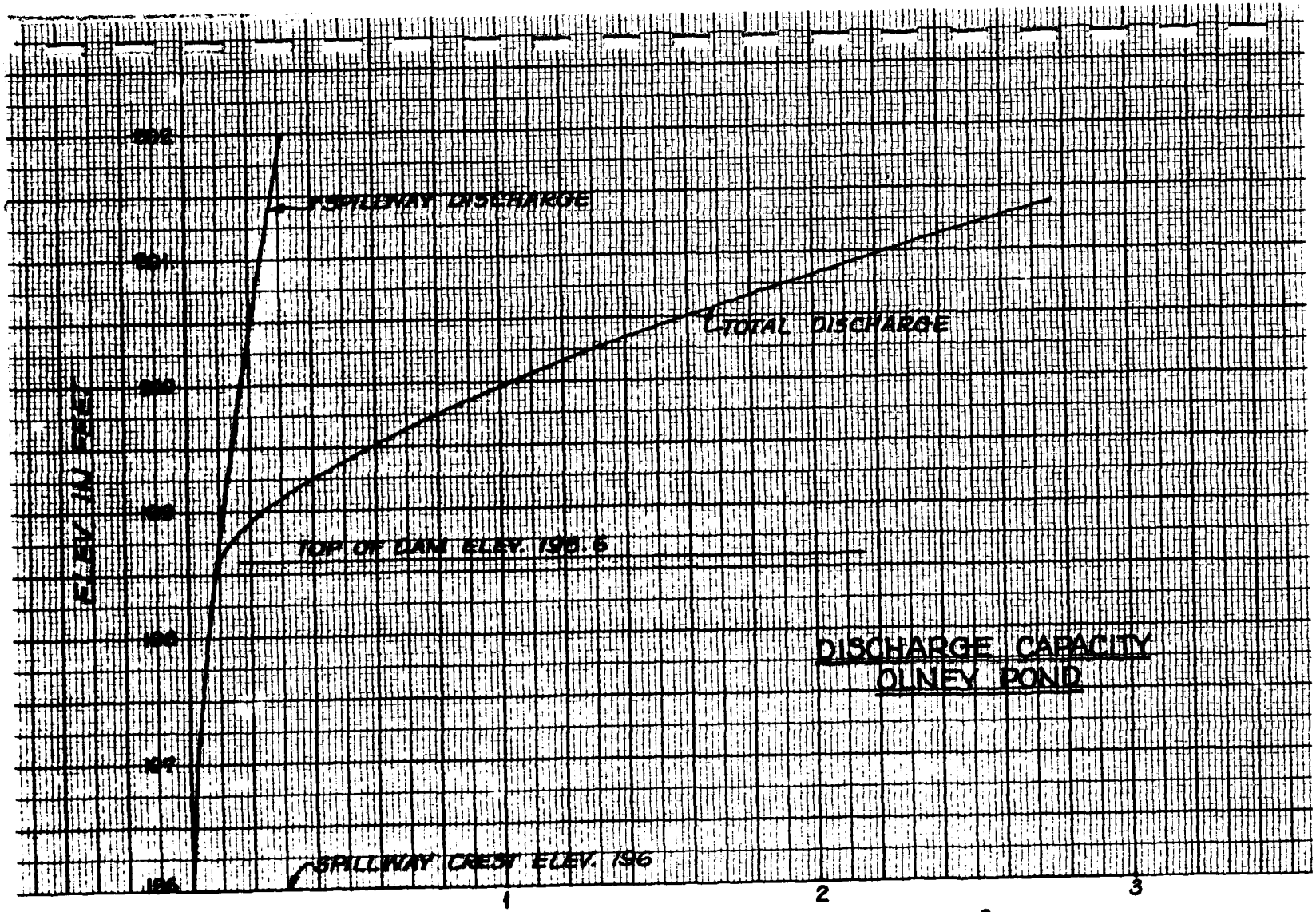
TABLE 7. OLNEY POND DAM - BREACH DISCHARGE

Res. Elev.	H	Disch./ft	Average Disch./ft	ΔL	ΔQ	ΔQ/ΔL	ΔQ/50	Total Q
198.6	23.5	269.2	239.6	0	215	6405	13460	19,865
194.1	25	210	180.2	10	1802	1249	10500	14759
189.1	20	150.3	124	10	1240	2447	7513	9960
184.1	15	97.6	75.3	10	753	1207	4880	6093
179.1	10	53.1	36	10	360	454	2656	3110
174.1	5	18.8	9.4	10	94	96	939	1030
169.1	0	0			0	0	0	0



Dam length = 200'
Ave. breach width
0.4 × 200 = 80'

$q = 16 H^{3/2}$



DISCHARGE CAPACITY
OLNEY POND

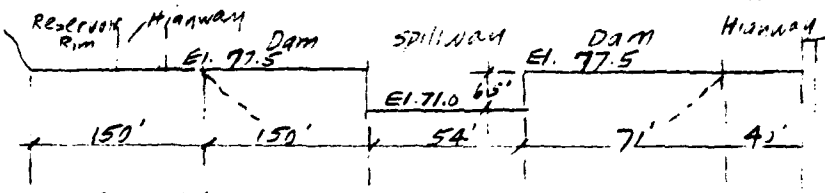
D-9A

BY ____ DATE ____ **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-10 OF ____

CHKD. BY ____ DATE ____ INSPECTION OF DAMS PROJECT ____

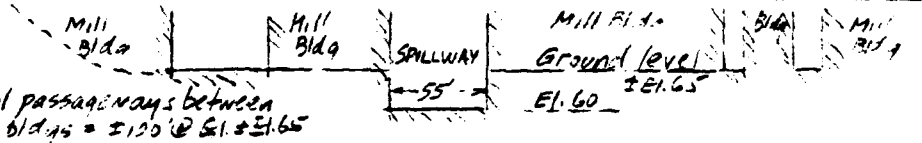
SUBJECT OLNEY POND RESERVOIR

TABLE 8. BARNEY POND BELOW OLNEY POND - DISCHARGE CAPACITY



ELEV.	H	SPILLWAY L=54' ΔQ	DAM L=261 C=±2.9 H	DAM ΔQ	LEFT ABUTMENT L=150 C=±2.5 H	LEFT ABUTMENT ΔQ	TOTAL DISCHARGE CF	REMARKS
71	0	0					0	
72	1	160					160	
73	2	460					460	
74	3	860					860	
75	4	1340					1340	
76	5	1870					1870	
77	6	2460					2460	
77.5	6.5	2770	0	0	0	0	2770	Top of dam
78	7	3100	0.5	260	0.5	140	3500	
78.5	7.5	3440	1.0	750	1.0	375	4550	
79	8	3790	1.5	1400	1.5	700	5900	
79.5	8.5	4150	2.0	2150	2.0	1100	7400	
80	9	4520	2.5	3000	2.5	1500	9000	
81	10	5300	3.5	4950	3.5	2500	12750	
83	12	7100	5.5	9800	4.5	4250	21650	

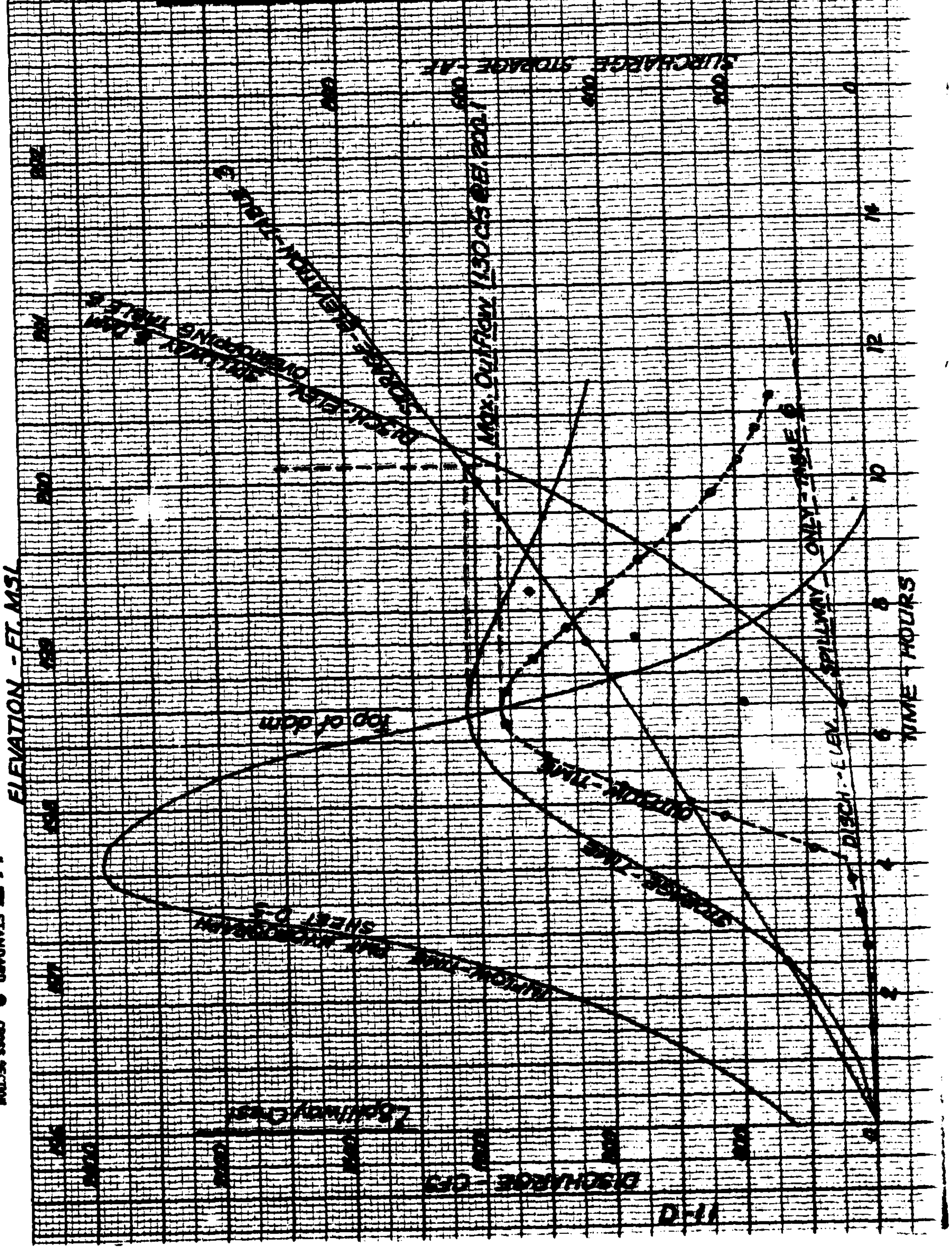
TABLE 9. BLEACHERY POND BELOW BARNEY POND - DISCHARGE CAPACITY

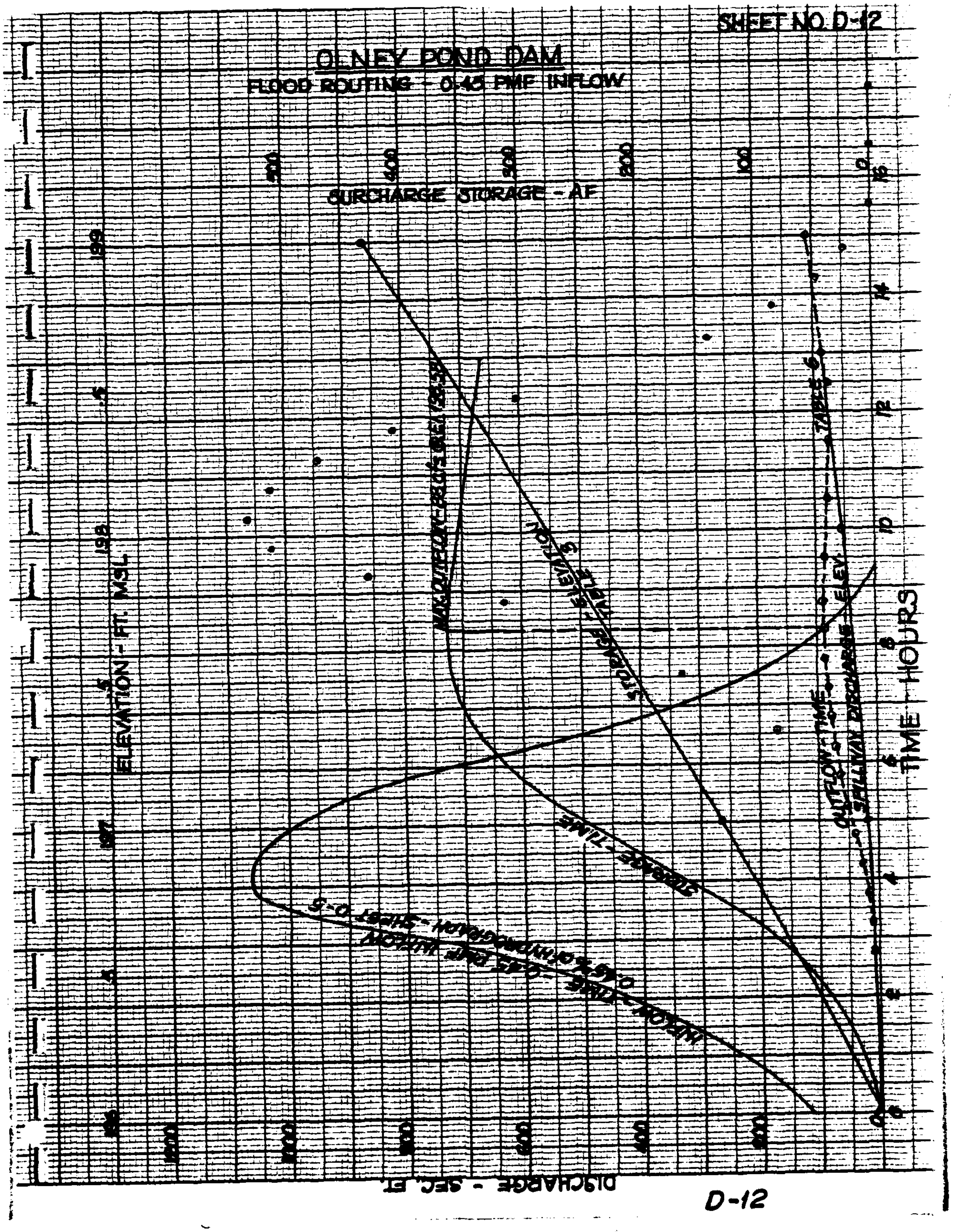


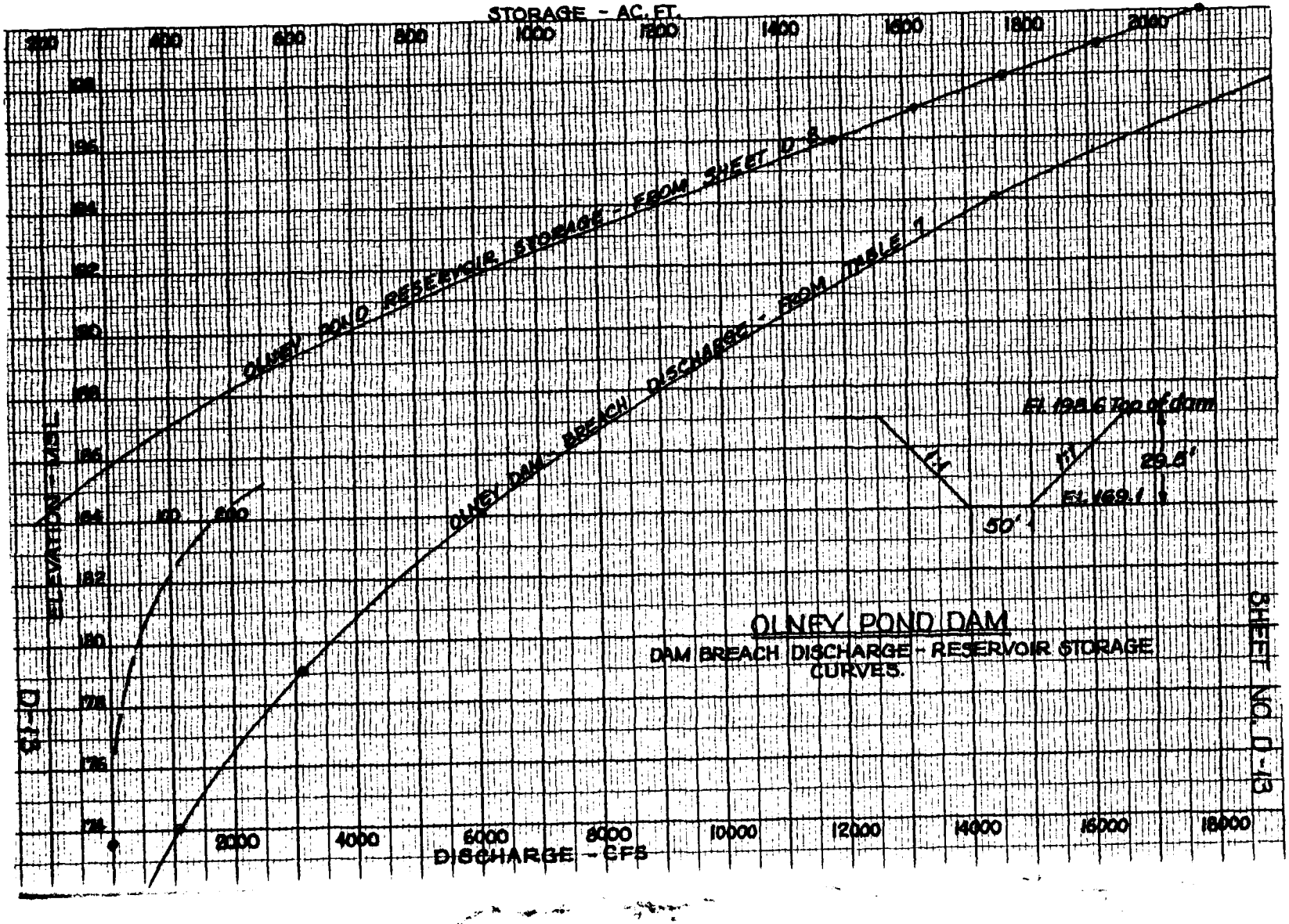
ELEV	SPILLWAY L=55 C=±3.0 H	SPILLWAY ΔQ	100' WIDE PASSAGEWAYS BETWEEN MILL BLDGS H	C	ΔQ	TOTAL DISCHARGE	REMARKS
60	0	0				0	
65	5	1850	0	-	0	1850	Top of dam and overland area upstream
66	6	2400	1	1.0	100	2500	
68	8	3730	3	1.2	620	4350	
71	11	6020	6	1.3	1910	7930	
74	14	8650	9	1.5	4350	12700	
77	17	11600	12	1.6	6500	18100	

SHEET NO. D-11

OLNEY POND DAM
FLOOD ROUTING - PMF INFLOW




SHEET NO. D-12
OLNEY POND DAM
FLOOD ROUTING - 0.45 PMF INFLOW
SURCHARGE STORAGE - AF
ELEVATION - FT. MSL
TIME - HOURS
DISCHARGE - SEC. FT.
MAX. OUTFLOW - 400 C.F.S. (ELEV. 198.3)
STORAGE - ELEVATION TABLE
STORAGE - TIME
INFLOW - TIME - 0.45 PMF INFLOW
OUTFLOW - TIME
TABLE 6
ELEV.
SPILLWAY DISCHARGE


STORAGE - AC. FT.
200
400
600
800
1000
1200
1400
1600
1800
2000
OLNEY POND RESERVOIR STORAGE - FROM SHEET D-8
OLNEY DAM - BREACH DISCHARGE - FROM TABLE 1
EL. 194.6 Top of dam
29.6'
EL. 169.1
50'
1
1
ELEVATION - MSL
190
188
186
184
182
180
178
176
174
2000
4000
6000
8000
10000
12000
14000
16000
18000
DISCHARGE - CFS
OLNEY POND DAM
DAM BREACH DISCHARGE - RESERVOIR STORAGE CURVES.
SHEET NO. D-13
D-13

BY GT DATE 8-29-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-14 OF...

CHKD. BY..... DATE..... INSPECTION OF DAMS PROJECT.....

SUBJECT OLNEY POND DAM - DAM BREACH ROUTING

ASSUME: (1.) DAM BREACHES WHEN RESERVOIR REACHES TOP OF DAM. 0.45 PMF INFLOW WILL RESULT IN RESERVOIR REACHING TOP OF DAM AT HOUR 8 AFTER START OF FLOOD ROUTING

(2) DECAY TIME OF 1/2 HOUR ASSUMED FROM START OF BREACHING TO FULL BREACHING. OUTFLOW PROGRESSES AT RATE OF 500 cfs per min. DURING BREACHING.

TABLE 10. BREACH OUTFLOW HYDROGRAPH - OLNEY POND DAM

TIME HRS	TRIAL RESERVOIR WATER LEVEL FT	BREACH DISCHARGE CFS	AVERAGE BREACH DISCH CFS	RELEASE AF	RESERVOIR STORAGE AF	FINAL RESERVOIR WATER LEVEL FT
8.00	198.6	0	-	-	1855	
8.10	-	3000	1500	12.4	1842.6	198.5
8.20	-	6000	4500	37.1	1805.5	198.3
8.30		9000	7500	61.9	1743.6	197.8
8.40		12000	10500	86.6	1657.0	197.2
8.50		15000	13500	111.4	1545.6	196.4
8.60		16200	15580	128.3	1417.5	195.5
8.70	194.6	15100	15600	128.7	1288.8	194.6
8.80	193.8	14200	14650	120.9	1167.9	193.8
8.90	193.0	13500	13850	114.3	1053.6	193.0
9.00	192.1	12600	13050	107.7	945.9	192.1
9.25	190.2	10900	11750	242.3	703.6	190.2
9.50	188.2	9150	10025	206.8	496.8	188.2
9.75	186.2	7600	8375	172.7	324.0	186.2
10.00	184.3	6150	6875	141.8	182.2	184.3
10.25	182.3	4900	5525	114.0	68.2	182.3
10.50	174.0	1000	2950	60.8	7.4	174.0

BY CJH DATE 8/29/79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-15 OF...
CHKD. BY ..... DATE ..... INSPECTION OF DAMS PROJECT .....
SUBJECT OLNEY POND DAM - HYDROLOGY

INFLOW HYDROGRAPH INTO BARNEY POND FROM MOSHASSUCK RIVER

MOSHASSUCK RIVER ABOVE BARNEY POND DAM - D.A. = 3912 AC = 6.1 Sq. MI.
LENGTH OF LONGEST RIVER COURSE = 5.075 mi.
DROP IN ELEVATION OF RIVER COURSE = El. 455 - El. 71 = 385'
H = 385' L = 5.075 mi $S = \frac{385}{5.075} = 76'/mi.$

$Lag = K\left(\frac{L L_c}{\sqrt{S}}\right)^{.33}$ hrs Use K = 5 (curve C)

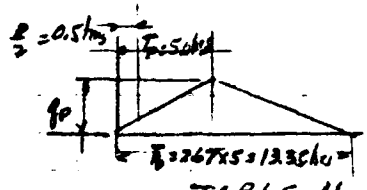
$Lag = 5.0\left(\frac{5.075 \times \frac{5.075}{2}}{\sqrt{76}}\right)^{.33} = 5 \times 1.137 = 5.68$ hrs.

$T_p = 0.410 + 0.82(Lag)$ D = 1 hr T_p = 5.07 hrs Say 5.0 hr.

using: $T_p = \frac{D}{2} + 0.6\,T_c$

T_c = Travel time from most distant point = $\frac{T_p - \frac{D}{2}}{0.6} = \frac{4.5}{0.6} = 7.5$ hrs

Average velocity of flow = $\frac{5.075 \times 5280}{7.5 \times 3600} = 1.0$ ft/sec.



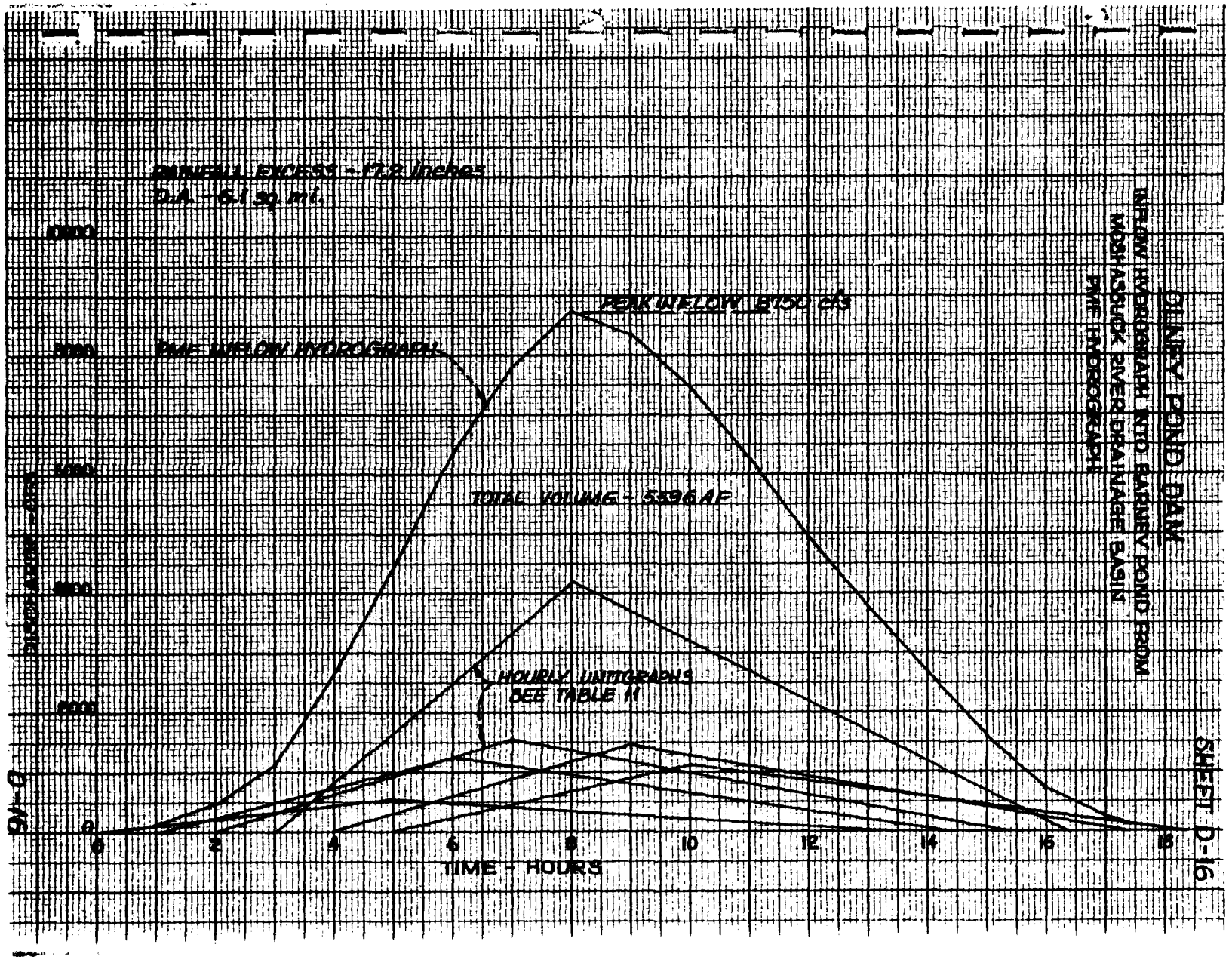
PMP = 24". Reduction for fit = 20%
Reduction for area = 0%
∴ PMP rainfall = 24 x 0.8 = 19.2"

$q_p = \frac{484AQ}{T_p}$; Q = 1" $q_p = \frac{484 \times 6.1}{5} = 590$

TABLE II

Time hrs	Distribution %	Rainfall inches	Inf. Hrtn loss - in.	Rainfall Excess - in	PMF Unitgraph
0					
1	10	1.92	1.0	0.92	543
2	12	2.30	0.2	2.10	1239
3	15	2.88	0.2	2.68	1581
4	38	7.30	0.2	7.10	4189
5	14	2.69	0.2	2.49	1469
6	11	2.11	0.2	1.91	1127
				17.2"	

Total runoff = $6.1 \times 640 \times \frac{17.2}{12} = 5596$ A.F.


RAINFALL EXCESS - 17.2 Inches
D.A. - 6.1 sq. mi.
PEAK INFLOW 8750 cfs
INFLOW HYDROGRAPH
TOTAL VOLUME - 5396 AF
HOURLY UNITGRAPHS
SEE TABLE H
TIME - HOURS
INFLOW HYDROGRAPH INTO BARNEY POND FROM
WASHASUCK RIVER DRAINAGE BASIN
PMF HYDROGRAPH
BARNEY POND DAM
SHEET D-16
D-16

BY O.M. DATE 8-30-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-17 OF.
CHKD. BY DATE INSPECTION OF DAMS PROJECT
SUBJECT OLNEY POND DAM - HYDROLOGY

BARNEY POND INFLOWS FROM MOSHASSUCK RIVER AND OLNEY POND OUTFLOWS - 0.45 PMF.

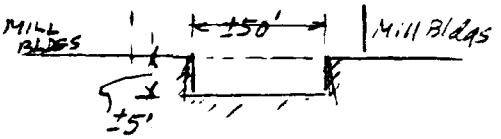
TABLE 12

Hour	Moshassuck R. Inflows - cfs		Case 1. Olney Dam does not breach		Case 2. Olney Dam overtops and breaches	
	PMF Hydrograph	0.45 PMF Hydrograph	Olney Dam Outflow	Total Inflow into Barney Pond	Olney Dam Outflow	Total Inflow into Barney Pond
0	0	0	0	0	0	0
1	100	45	5	50	5	50
2	500	225	10	235	10	235
3	1150	518	15	533	15	533
4	2650	1192	22	1214	22	1214
5	4450	2003	45	2048	45	2048
6	6400	2880	70	2950	70	2950
7	7800	3510	80	3590	80	3590
8	8750	3938	88	4026	88	4026
8.1	8700	3915	88	4003	3000	6915
8.2	8670	3902	88	3990	6000	9902
8.3	8630	3884	88	3972	9000	12884
8.4	8600	3870	88	3958	12000	15870
8.5	8550	3848	88	3936	15000	18848
8.6	8510	3830	88	3918	16100	19930
8.7	8480	3816	88	3904	15100	18916
8.8	8430	3794	88	3882	14200	17994
8.9	8400	3780	88	3868	13500	17280
9.0	8350	3758	87	3845	12600	16358
9.25	8140	3663	87	3750	10900	14563
9.50	7900	3555	86	3641	9150	12655
9.75	7700	3465	86	3551	7600	11065
10.0	7450	3353	85	3438	6150	9503
10.25	7170	3226	85	3311	4900	8126
10.5	6870	3092	84	3171	1000	4092
	From FIG. Sheet D-16		From FIG. Sheet D-12		From TABLE 10 Sheet D-14	

BY CSM DATE 8-30-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-19 OF.
CHKD. BY DATE INSPECTION OF DAMS PROJECT
SUBJECT OLNEY POND DAM - DOWNSTREAM HAZARD ANALYSIS

MOSHASSUCK RIVER BELOW BLEACHERY POND

MOSHASSUCK RIVER BELOW BLEACHERY DAM (NOTED ON USGS QUAD AS MOSHASSUCK VALLEY) IS A RECHANNELIZED REACH OF THE RIVER CONFINED BY VERTICAL WALLS. THE STREAM BED TRAVERSES UNDER MILL BUILDINGS AND ALONG THE RAILROAD BED, AND IS ENTRENCHED ABOUT 5 FT. OR LESS BELOW THE ADJACENT GROUND LEVEL. A TYPICAL CROSS SECTION IS ANALYSED BELOW



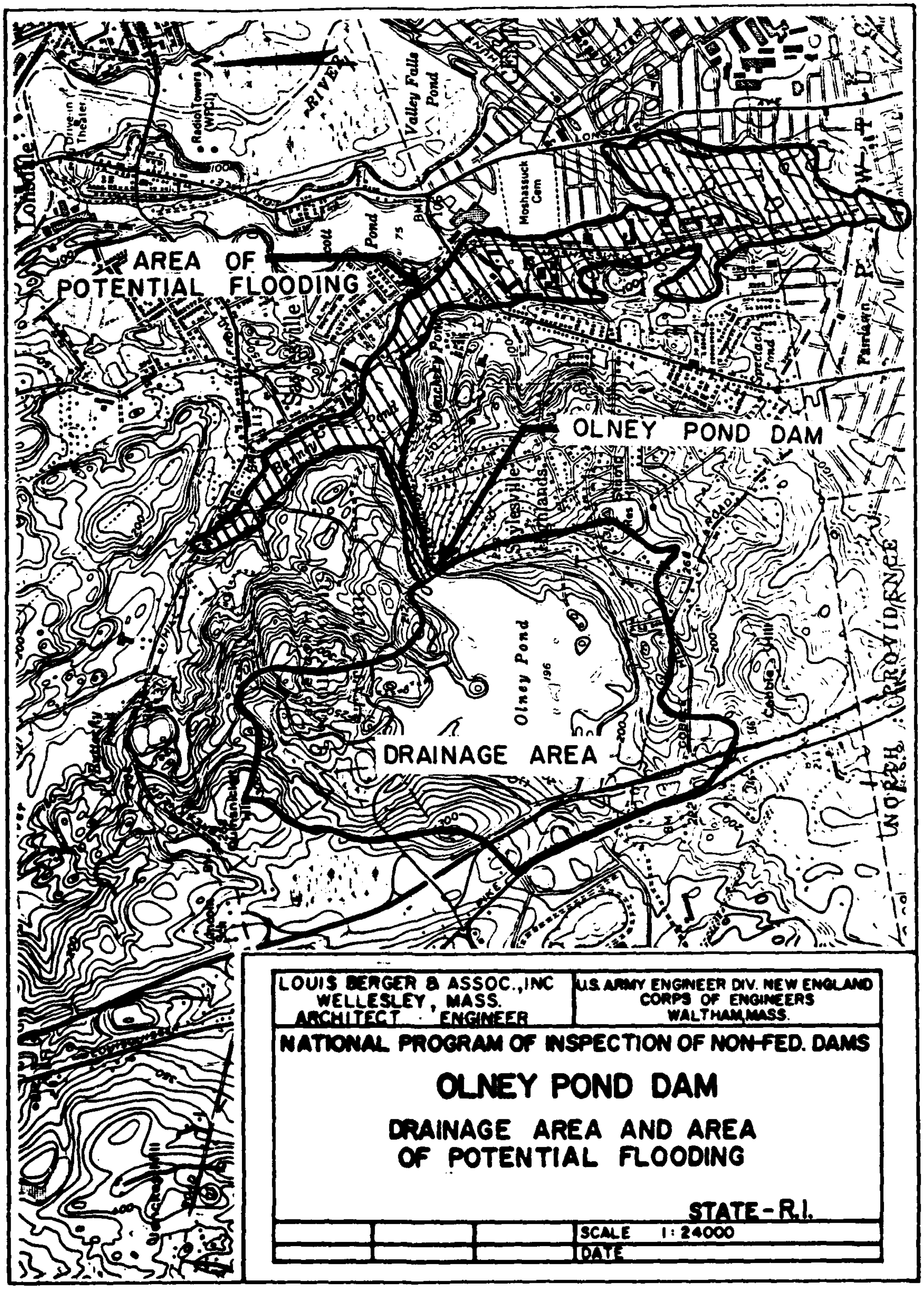
with water surface to level of stream bank.

$A = 5 \times 50 = 250$ sq. ft.

$wp = 60'$ $\quad r = \frac{250}{60} = 4.17$ $\quad r^{2/3} = 2.59$

$S = 10'/mi = \frac{10}{5280} = .0019$ $\quad S^{1/2} = 0.0435$ $\quad n = \pm 0.03$

$Q = \frac{1.486}{n} A r^{2/3} S^{1/2} = \frac{1.486}{.03} \times 250 \times 2.59 \times .0435 = 1395 cfs$



LOUIS BERGER & ASSOC.,INC WELLESLEY, MASS. ARCHITECT · ENGINEER	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM,MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

OLNEY POND DAM

DRAINAGE AREA AND AREA OF POTENTIAL FLOODING

STATE - R.I.

SCALE 1:24000

DATE

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

STATE	IDENTITY NUMBER	DIVISION	STATE	COUNTY	CONGR. DIST.	OTHER	COUNTY	CONGR. DIST.	NAME	LATITUDE (NORTH)	LONGITUDE (WEST)	REPORT DATE DAY | MO | YR
RI	1702	NED	RI	007	01				OLNEY POND DAM	4153.7	7125.6	22AUG79

POPULAR NAME	NAME OF IMPOUNDMENT
LINCOLN WOODS STATE PARK	OLNEY POND

FEDERAL	BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	DIST FROM DAM (MI.)	POPULATION
01	06	THREADMILL BROOK	LINCOLN	0	1618

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FT.)	HYDRAULIC HEIGHT (FT.)	IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT.)	NORMAL (ACRE-FT.)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
REPG	1883	R	30	30	1860	1490	NED	N	N	N	N	

REMARKS

DAM MAP	SPILLWAY CREST LENGTH (FT.)	SPILLWAY TYPE	SPILLWAY WIDTH (FT.)	MAXIMUM DISCHARGE (CFS)	VOLUME OF DAM (CY)	POWER CAPACITY INSTALLED	POWER CAPACITY PLANNED	NAVIGATION LOCKS NO.	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
1	220	U	7	180	12600											

OWNER	ENGINEERING BY	CONSTRUCTION BY
STATE OF RHODE ISLAND		

REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

INSPECTION BY	INSPECTION DATE DAY | MO | YR	AUTHORITY FOR INSPECTION
LOUIS BERGER & ASSOCIATES	22AUG79	PL92-367

REMARKS

END

DATE
FILMED

9-85